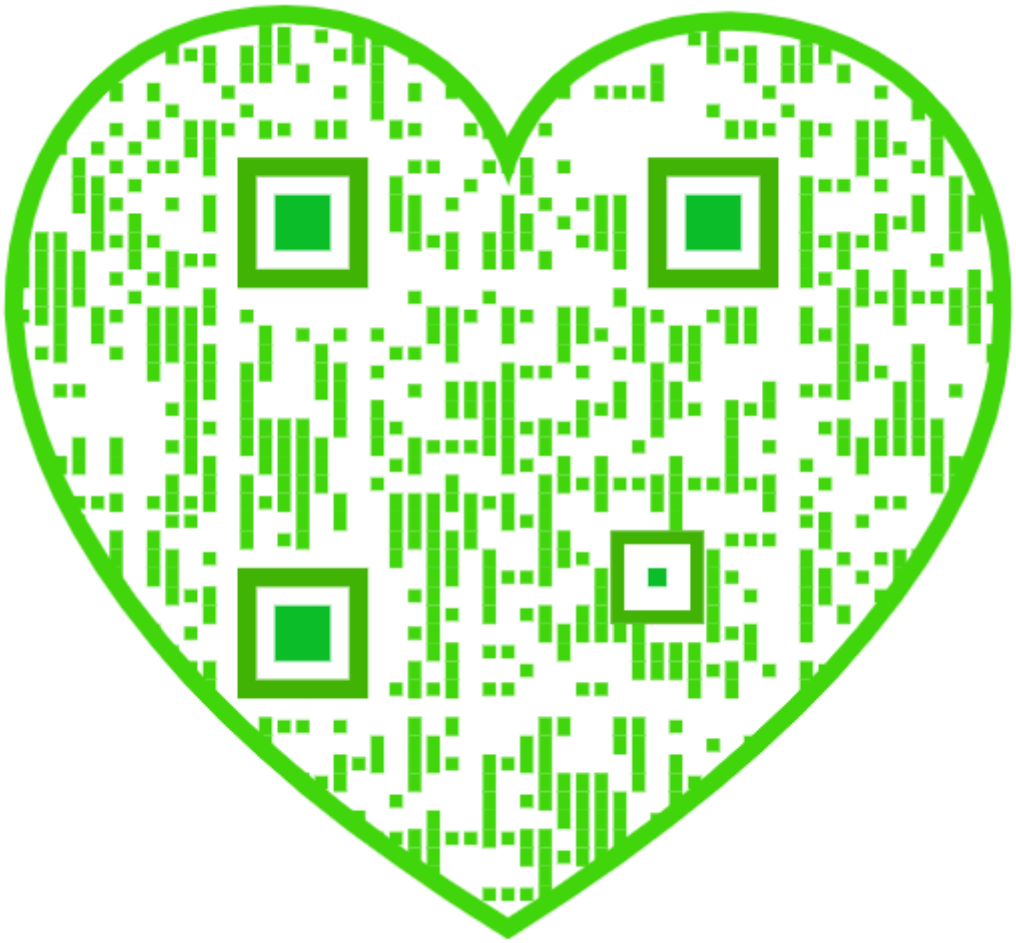

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CALLORHYNCHUS ANTARTICA.

FISHES AND FISHING.

ARTIFICIAL BREEDING OF FISH,

Anatomy of their Senses,

THEIR LOVES, PASSIONS, AND INTELLECTS.

WITH ILLUSTRATIVE FACTS

BY W. WRIGHT, ESQ.

SURGEON AURIST TO HER LATE MAJESTY QUEEN CHARLOTTE, TO HIS ROYAL HIGHNESS THE LATE DUKE OF CAMBRIDGE, FIELD-MARSHAL HIS GRACE THE LATE DUKE OF WELLINGTON, AND HER ROYAL HIGHNESS THE LATE DUCHESS OF GLOUCESTER.

LECTURER ON THE ANATOMY AND PHYSIOLOGY OF THE EAR; ON CHEMISTRY, AND THE MEDICAL APPLICATION OF ELECTRICITY; AUTHOR OF MANY WORKS ON DISEASES OF THE AUDITORY ORGANS; AND OF NUMEROUS PAPERS IN THE LANCET FROM 1831 TO 1843.

597
Wr

LONDON:

THOMAS CAUTLEY NEWBY, PUBLISHER

30, WELBECK STREET.

1858.

TO

THE NOBLEMEN AND GENTLEMEN,

WHO HAVE IN SUCH A PRAISEWORTHY MANNER

ASSOCIATED THEMSELVES

TO PROTECT OUR NOBLE RIVER FROM POACHERS,

"The Thames Angling Preservation Society,"

THIS WORK

IS RESPECTFULLY DEDICATED, BY

THEIR VERY OBEDIENT SERVANT,

W. WRIGHT.

No. 4, Duke Street, St. James' Square.

ERRATA.

Page 125, "Wrus" should be "Wrass."

Page 190, last paragraph beginning "I had enough," and ending, "good sport in taking perch," should come in page 193, after "rights of the Church," and immediately before "Perch are a very voracious fish."

Wherever the name of "Sir Francis Chantry" is mentioned, read "Chantrey."

ADDRESS TO ANGLERS.

During a great number of years I have been in the constant practice of entering in a book the result of my own observations, or authentic facts gleaned from sources which could be depended upon, and worthy of being remembered, relative to Angling, in all its branches; and I hope I shall be rendering an acceptable service to those fond of the recreation, by giving my Memoranda to the admirers of that fascinating and health-inspiring amusement. Should my experience assist any worthy brother of the angle to increase his sport or amuse him at seasons when he cannot enjoy the reality, I shall feel myself amply repaid.

THE AUTHOR.

INTRODUCTION.

As Oppian is often referred to in the following pages, it may be proper to give some account of him, more particularly as he was the first who ever wrote upon Fishes, and Fishing.

He was the last of the Greek poets, and flourished about 1652 years ago, in the reign of Severus Septimus, Emperor of Rome, who succeeded to the throne about A.D. 192. Oppian's father, Agesilaus, was a man of wealth and distinction, at Anazarbus, in Cilicia, where Oppian was born, A.D. 183. Agesilaus being of a studious and philosophical disposition, avoided the fatigue and hurry of public meetings; and when the emperor, in his progress through Cilicia, entered Anazarbus, the old gentleman hoped his studious habits would excuse his attendance on Severus. But the emperor being of a very tyrannical disposition,* considered the non-attendance of Agesilaus as

* Of all the Roman emperors whose busts are in the British Museum, his is the most handsome.

a mark of such disrespect, that he banished him to the island of Malta. Oppian, with filial piety, accompanied his father in his exile, and there wrote his Halieuticks; or, the nature of Fishes, and Fishing; thought to be one of the finest remains of antiquity.

According to the custom of those times, Oppian recited his Halieuticks in a public theatre, before the emperor, who was so delighted with the sweetness of the composition, the novelty of the subject, and probably the flattery of himself, and his son Caracalla, who reigned jointly with his father, diffused throughout the whole poem, that in order also to support his character as a patron of learning, of which he was proud, he desired Oppian to ask what he would,—nothing should be denied to him. Oppian prayed for the restoration of his father to liberty, and to his country; the emperor not only granted this, but presented him with 3,506 staters of gold, each stater being about 16*s.* 4*d.*, or together then of the value of £2863 2*s.* 8*d.* The munificent gift at the present time would be enormous in value.

Oppian was, no doubt, personally engaged in the diversions he so well describes, and also availed himself of all the knowledge of more ancient philosophers in the prosecution of his studies as a naturalist; he united the *utile et dulce*, the philosopher with the

gentleman, and though a heathen, his morality and religious sentiments would put to the blush many who consider themselves wiser men.

Soon after his favourable reception at the court of Severus, he returned to his paternal home; but he did not long enjoy the pleasures resulting from having obtained the liberty of his father, for the plague cut off this last of the ancient poets, in the thirtieth year of his age. The citizens of his native city, to mark their grief for his loss, gave him a most honourable funeral, and erected a statue to his memory, with this inscription:—

"Though much they lov'd, no Heliconian maid
Could *Oppian* save, or sullen Fate persuade.
The rigid *Destinies'* superior power
Snapt quick the thread, and fix'd the hastened hour,
But had these *Sisters*, like the nine, been kind,
Nor Oppian's life to thrice ten years confin'd,
All the inspired had him their chief allow'd,
And all to him their humbler laurels bow'd."

Many of the fishes which, when Oppian wrote, swam in the Mediterranean, are totally unknown in our seas, or have not been caught by the fishermen of this part of the world; others puzzle modern Ichthyologists to determine what fishes are intended by the ancient descriptions of them; and large allowances

must be made for the talented translators, Messrs. Diaper and Jones, in their endeavours to give English names to those, to which they had no guide, but the Greek ones, by which they were distinguished.

Oppian chiefly studied the fishes of the ocean; but there is little doubt those inhabiting fresh water are analogous in their nature, habits, passions, generation, senses, and enemies; however, it is not proposed, neither would it be possible, to follow him relative to all the fish he mentions.

Oppian wrote three poems, each containing five books; of that on beasts, and hunting, the last book is believed to be totally lost; and of that on birds and fowling, there is only a Greek paraphrase remaining. This on fishes and fishing is perfect; and there are several translations. I have referred to the University of Oxford edition.

According to him, the implements used by ancient fishermen were—

> "The slender woven net, vimineous weel,
> The taper angle, line, and barbed steel,
> Are all the tools his constant toil employs;
> On arms like these the fishing swain relies."

It was supposed by the ancients, that immense fish, much larger than whales, peopled the depths of the sea

beyond where soundings could be obtained, namely, 300 fathoms, or 1800 feet; below that depth, it was supposed the line only *appeared* to sink, but *really* did not.

On the 26th December, 1850, in latitude 28° 21′ south, longitude 29° 17′ west, the bottom was reached at 3,100 fathoms, 18,600 feet (3½ miles); and since that, an American ship has sounded in coming over to this country, and found the bottom, and the state of it, by a very ingenious apparatus, at the depth of above nine miles!

FISHES AND FISHING.

At a very distant period from the present time, I found myself the inmate of a large, old-fashioned mansion-house, surrounded with extensive walled-in gardens, beautiful pleasure grounds, a bowling-green, a wilderness, a canal with small summer-houses, under weeping willows at one end, and a handsome stone temple at the other, and a clear trout stream running at the bottom of the garden; numerous stables, coach-houses, laundries, poultry-houses, and yards, with other offices, were attached to the premises. All these were situate down a lane called Water Lane, leading out of the main street on entering Dartford, in Kent, a posting town, *then* of very considerable notoriety, being the chief direct road to the continent. The middle of this lane was occupied by a shallow stream of clear water; on one side of it was a raised foot path: on the other side, the water washed

the hedge, within which were a few detached cottages, with small gardens, reached by stepping from one little post or stump, to another; these stumps were placed at certain distances apart, so that a carriage could pass down the lane with a dexterous, accustomed driver; to a stranger it appeared wonderful, how easily men, women and children, stepped from one of these little posts to the other, without ever falling into the water. As this stream approached the mansion-house offices, the ground was raised artificially, and the water was conducted in an open brick channel, over gravel, under a small parlour window, but being confined in space, it was consequently deeper, and ran with more velocity, and a rippling sound over its pebbly bed, till it passed under an arch, over which was the large porch of the mansion. A few yards from the house, the stream re-appeared and occupied the middle of the lane, having dwelling-houses, and a continuous pathway on one side, and a long walk shaded with fine lime trees, on the other; outside of the high walls of the garden of the mansion-house, the water in the middle continued in its course into a creek called Dartford Creek, which fell into the Thames, and at spring tides the water was a good depth, even up to the porch of the house. I am thus particular, for a reason which will be seen hereafter; the trout river which bounded the garden, orchard,

and grounds just below them, expanded into a very large pond, and the superfluity of the water not required for the mill, passed over a tumbling bay by the side of that building. In Doomsday Book, a mill was mentioned; but it was then, and had been long before, a mill for grinding corn. According to Mr. Dickens, Sir John Spielman, Jeweller to Queen Elizabeth, whose tomb (that is, Sir John's) is in Dartford Church, built a paper-mill for the making of writing-paper, and Her Majesty granted him a license "for the sole gathering for ten years of all rags," &c. "necessary for the making of such paper." It is said that Sir John, in coming to this country from Germany, brought with him two young lime trees, which he set before his dwelling-house at Dartford. This house, therefore, in which I was born, leased with the mill, was no doubt the mansion built by Sir John Spielman, in a style of magnificence suitable to his position in life; and the ball room, grounds, and gardens, where I used to play, had been formerly graced by royalty, courtly knights and dames.

A paper-mill was erected at Dartford in 1588, but this was not the *first* of the kind set up in England, as is generally stated. In the above year, Thomas Churchyard published a poem entitled, "A description and playne discourse of Paper, and the whole benefits that Paper brings, setting forth in verse a

Paper Myll built near Dartfoord, by an high Germaine, called Master Spilman, Jeweller to the Queenes Majestie." According to the Harleian MS., 2296, a special license was granted in 1589 to John Spilman, "for the gatheringe of all manner of linen ragges, scrolles or scrappes of parchment, peace o lyme leather, shredds and clippings of cardes, and oulde fishinge nettes, fitte and necessarie for the makinge of all or anie sorte or sortes of white wrightinge paper for the space of tenne years next ensuing." Spilman was knighted by James I. in 1605, and not by Queen Elizabeth as is commonly said (*see* Nichols' *Progresses of James I.*). Churchyard alludes to a paper-mill built by Sir Thomas Gresham; this was most likely in Osterly Park. But the priority is to be claimed for *Hertford;* that one was standing there in the reign of Henry the Seventh, is clearly proved by three independent authorities. 1st. One of the notes to Vallans's "*Tale of Two Swannes*, 1590," affirms that in 1507 there was a paper-mill at Hertford, and belonged to John Tate, whose father was Mayor of London. 2nd. This John Tate is shewn to have been the first paper-maker in England, in a very valuable work in the British Museum, the English translation of Bartholomew Glanvile's "De Proprietatibus Rerum," printed by Wynkyn de Worde, about 1495; at the end are these lines:—

"And *John Tate* the younger joye mote he broke,
Which late hathe in England doo make this paper thynne,
That now in our Englysshe this boke is printed inne."

This book is said to be the first printed on paper of English manufacture; our principal supplies previously to this, and for some time afterwards, being from France and Holland; and even so late as 1662, paper-making in this country had made little progress.

3rd. Henry VII. visited Hertford on the 23rd of May, 1498, and in the privy purse expenses of this sovereign occurs the following entry:—

"1498.—May 25. For a reward given at the *Paper Mylne* . . . . . 16s. 8d."

The "Express," October 9, 1855. Upon the authority of what Shakespeare has coined as part of Jack Cade's charge against Lord Say, that he, Lord Say, had "contrary to the king, his crown, and dignity, built a paper-mill;" this is in the Second Part of Henry the Sixth, Act iv. Scene 7, but is no proof that there was a paper-mill in Henry the Sixth's reign, any more than it is, that Lord Say either built or exercised any kind of instrumentality in erecting any such building, or that Jack Cade spoke so learnedly of "The King, his crown, and dignity."

How I became the inmate of this antiquated mansion, I know not; but I was, as I found after a little time, as knowledge began to dawn upon me, born in it, and was the only son of a gentleman and his wife, who were the much-respected inhabitants of this large building, and the only persons enjoying it, and the luxuries of its prolific gardens; but how I acquired that title is a mystery beyond the finite comprehension of human beings; we find ourselves in that relationship to certain individuals, but when or how we came into existence, we are in a state of complete ignorance.

One of the earliest of my reminiscences is that of seeing a large basket brought into the garden through a door near the mill pond, on to the grass plot which surrounded the lake or canal, and a great number of fish turned out upon the green sward, which my father, aided by one or two of his men, were placing in rows side by side, shifting them from one place to another; this, I since know, was for the purpose of assorting them into braces or pairs, as nearly alike as could be, to send away as presents; some were sent into the house to be cooked for dinner, and some were given to the workmen. It is now nearly, or quite eighty-three years ago, yet the scene is fresh in my memory, the beauty of their red spots now flash in my eyes, and their fragrance even now, I can fancy

regales my olfactory nerves. Such are the lasting impressions made upon us in our days of early childhood. My mother never having tasted fish, when I, as a child, saw a lady partake of it for the first time, I regarded her with astonishment, and could scarcely believe that the person I saw before me was of the feminine gender: indeed, I *think*, I looked closely at the chin to see if there were any appearance of a beard.

These scenes of the assortment of fish, which I since know were trout, were repeated frequently during the fine warm weather; after a time, I was allowed to be present at these fishings, either in care of my mother, or a servant. The manner of conducting them was thus: a portion of the water in the mill-pond was allowed to run off, then two men went into the water with a long net, having a pocket in the centre, bungs at the top, and leads at the bottom; at each end of the net was a staff five or six feet long; one man placed himself close to the bank, and the other took a good circuit, and came round to the bank; persons on shore and behind the net, as soon as the semicircle was complete, beat the water with poles, both to prevent the trout from springing over the net, and to drive them into the pocket of it, when the men came nearer each other, and finally the net was drawn ashore, the pocket was untied, the small fish were returned to the pond, and I have since understood that none were taken

under the estimated weight of three quarters of a pound. My father kept an account of all the trout he killed during nine years, and to whom he gave them, and I have heard him say, in after-years, that he generally took two hundred brace per annum.

The water which gave motion to the wheels of the mill, was discharged into the creek leading into the Thames; and one day, when I was about four years old, my father was leading me along at the back of the furnaces, where there was an open door, facing and nearly down to the water of the creek when the tide was up. I was frightened, and my parent startled, by a large fish, a salmon, springing in through the door, and falling nearly amongst the cinders of the furnace; my father secured the fish, which weighed 14lbs. About a year after that, I was disturbed, very early one morning, by a considerable noise, and when I went down to breakfast, there lay on a table in the great marble entrance-hall, a large salmon, above 20 lbs. as I was told, which had been captured close to the mansion-house, having come up with the spring tide, and endeavoured to get upward; but being discovered by one of my father's men, he aroused his master, and they two placed a net behind it, and when the tide receded, it became an easy prey. Often large salmon were killed by the water-wheels in trying to go up stream; this demon-

strates how powerful must be the instinct of this genus of the finny tribe to get out of salt, or brackish water, into fresh, at certain seasons of the year; further, and most splendid examples of it are to be seen in various parts of the world; and this American "*go a-head*" propensity was exhibited by the artificially bred little salmon endeavouring to make their way from the lower water to the higher, and overcoming the obstruction, to the great amusement of Her Majesty at the Dublin exhibition, for the water these young fish endeavoured to escape from was not salt or brackish.

When I grew a little older, I sometimes accompanied my father and mother to the tail of the mill, where they caught a large dish of fine flounders in a very short time, with what, I knew a few years after, was very rough tackle—but these fish are not particular.

In the large lake, or canal in the garden, through which always flowed a supply of fresh water, were very large eels; proper lengths of line, with baited hooks were attached to bungs, into each of which were fixed a good-sized white feather; these were thrown into the canal on favourable nights, and in the morning the bungs were easily discovered, and I often saw them taken out by my father with a long-handled rake, generally with a fish attached, and I

have heard my father say, none of these lines were ever totally lost.

Owing to some legal disputes about the quantity of water by millers higher up the river, the mills, mansion-house belonging, with its delightful gardens and grounds, where I had for the first six years of my life revelled in abundance of the most choice wall, and other fruits, and sat down daily to an amply supplied table, whereon fish, poultry, and every vegetable and fruit which the skill and industry of a professed gardener and assistants kept on the premises, in proper season, could produce, we removed to a village thirty-five miles distant. Immediately after my father left the house, it was pulled down, and about six years ago, when I visited the spot, there was a railway station erected thereon; a heap of rubbish as high as a moderate-sized house, occupied the place of the once beautiful grounds and garden, and the mill-pond, which used in my infancy to have some graceful swans on it, and was a large expanse of water, was now an expanded sheet of mud, with a rivulet of water meandering through it.

Before I say anything further of the miserable change the whole family experienced by the removal, a few reminiscences occur to me of this my native place.

When I was about four years old, I went to school

in the High Street of the town; on one occasion when my father was taking me there, and had nearly reached the door of the school, we were astonished to see two short, fat, middle-aged, well-known inhabitants, rush out of the church, where there had been a vestry meeting, and the moment they reached the street, they each knocked off the cocked hat and bushy powdered wig of his opponent, then the fashionable dress of that class of persons, and began to pommel each other most furiously. A crowd soon collected, and the post-boys (an impudent and numerous set of fellows) called out, "Well done, B——n; hit him again B——r." They were not separated until they had drawn blood from each other, and it was some time before either could walk the streets without eliciting the same cry from idle urchins or others; and I believe the circumstance gave rise to some employment for gentlemen of the long robe.

I also remember seeing large bodies of troops pass through the town to form a camp at Coxheath, and the King, George III., also going through to inspect it. Many ladies on horseback, and in phaetons, attired in military costume, as to the upper part of their dress, alone, or accompanied by officers, were continually passing to the same place.

The comforts and luxuries of my father's house attracted a succession of visitors from London, and

many chief and second mates of Indiamen, with whom he had become acquainted, who at that time brought up in the river, on their homeward voyage, my father sent presents of poultry, vegetables, and fruit, on board to his nautical friends; and my recollection is quite perfect of going on board with both my parents, and being hoisted up on deck in a chair in my mother's lap, and being let down in the same way into the boat on our return. My mother was fond of china, and bought on board at different times enough to fill her large china closet, which was conveyed *somehow safely home*, and she was much envied by many ladies for having such a collection.

I knew a Mr. T——d, a superior and most acute officer of the Customs, the terror of smugglers; he and my father were intimate, and he often dined at our house. One day, just as our family were setting down to dinner with him, two mercantile gentlemen, whom my father slightly knew arrived, and being, as they said, rambling about the country, they called to visit us. A very pleasant afternoon was spent by all; the wine circulated, of which I was allowed to partake, as I had a small glass which held about a thimbleful. A postchaise and four had been ordered by these gentlemen, to be in waiting, at a certain hour, a little way up the London road. They slipped away from the company under some pretence, reached the chaise, in

which was already another person, as was known afterwards, and arrived safe in London, with, it was believed, many thousand pounds' worth of valuable lace. T——d had by scouts gained information of this intended contraband affair; but the parties were too artful for the officers, for they walked, or in some way, as it was supposed, came across the country from the coast. My father was so much displeased at being thus, though innocently, made in some way instrumental to the scheme, that he never allowed either of those two persons to enter his house again.

My mother's brother had married a female belonging to a family respectable in their position, but inferior in habits, occupation, and manners to my father and mother, whose station and education were of a superior order. My aunt's brother, whom my father did not know, and who was a journeyman cabinet-maker, made an arrangement with a fellow-workman, presuming on the *very slight* relationship, to start from London on a Saturday night, or rather Sunday morning, and walk down to my father's to breakfast, where they arrived so dusty, travel-stained, and differently apparelled to those persons usually visiting at our house, that my father was obliged to lend them clean linen, &c. He was so vexed at the occurrence, that he wrote to my aunt next day, saying he had no objection to receive her

relatives as occasional visitors, but requested they would come so conveyed and attired as not to injure his respectability amongst his neighbours, workmen, and servants. The result was a total cessation of all intercourse between the families during about seven years.

Strange indeed are the mutations of this life, and an illustration may not be improperly introduced. My aunt's brother, who could at that time merely read and write English tolerably well, became under usher to a clergyman, who kept a school at or near Cambridge, and had married into my aunt's family. From that station this cabinet-maker, by diligence, came to be head usher of the clergyman's school; and at that time, when "*literate persons*" were freely ordained, he entered the church, subsequently married a person with a little property, became incumbent of one, if not two benefices in the county and diocese of Lincoln, and died respected by his parishioners. His fellow workman married the widow of a person who kept a colour shop. This second husband invented an article for the embellishment of a portion of ladies' persons, which became so fashionable that he acquired a good fortune by its most extensive sale; though now, such are the vagaries of fashion, that any lady wearing blue silk stockings, would be considered as having a very extraordinary taste in

dress. He was fortunate in the invention and sale of other articles, of colours, magic lanterns, &c., and through industry and integrity he became wealthy, highly esteemed as a tradesman, and by observation acquired a perfect knowledge of the world. We became intimately acquainted, and I regarded him as a friend.

Near his residence were several old houses, whose inhabitants paid no rent to any one, and whose only title was possession, the property being said to belong to a young lad then at sea. This property he obtained for a mere trifle, pulled down the old houses, and built a small theatre (which he named the Sans Pareil) upon the site, where he exhibited a variety of most ingenious divertisements, and at last obtained a license for theatrical performances. A few years previous to this period, some excise officers lodged information against the owners of most of the theatres, for not stamping their scenery, and paying a duty of threepence halfpenny a yard. The proprietors of the scenes *then* pleaded that it was an old act, and that they had erred through ignorance. The Attorney-General said that he would not press for convictions for the penalties, upon the understanding that the scenery should be stamped, and pay the duty in future; and the judges considered that the proprietors of theatres had been treated very leniently, by being

let off so easily as only to pay the costs of the solicitor of the Excise. Just as an offer was made (partly in my presence, and I advised it to be accepted) to purchase this theatre (now the Adelphi) as it stood, for £25,000, some excise officers, tempted by the prospect of a share of the very heavy penalties, obtained powers from the Commissioners to seize and leave a man in possession of the scenery in every theatre, panorama, and wherever a piece of unstamped painted canvas could be detected. Consternation most extreme was caused amongst theatrical and other persons concerned. Attornies and eminent counsel were consulted, reference was made to East's Reports of the former proceedings, the legal gentlemen shook their heads, and offered no hope; the only thing they could advise was to petition the Board of Excise, which was done, praying that they would accept of bonds with sufficiently responsible sureties, for the value of the scenery, and the duties, that if on trial the scenery should be declared forfeited, the whole amount should be paid. To which the Board replied, "That the scenery must be measured, the duty paid immediately, a bond given for the value of the scenery; but should the result of the proposed trial be even in favour of the theatres, *no return* of the duty must be expected; and until the scenery was measured, and the duty paid, the men must re-

main in possession of every theatre, &c., &c. And all old and useless scenery must also be stamped and paid for, or removed to the Excise Office and destroyed." These were the *generous* (?) terms proposed by the Commissioners, as appears by a letter from the attorney of Mr. John Astley, now before me, after he had had an interview with the solicitor of the Excise Board, and received this as their determination. Desirous of serving Mr. John Astley, my friend, Mr. Scott, the proprietor of the Sans Pareil, as it was *then* named, and the other parties whom I considered harshly treated, and thinking I could read and understand an Act of Parliament, I sought, and with some difficulty found and purchased, the Act 10th of Anne, cap. 19, when reading it over *most carefully*, almost word by word, I discovered that the statute only applied to painted canvas, &c., which was FOR SALE, and as scenery was NOT FOR SALE, it was evident that, in defiance of the dictum of judges, the opinions of counsel, attornies, or the determination of the Board of Excise and its officers, I could extricate my friends and all concerned from their difficulties; and though I felt I had the power in my hands to do so, I induced Mr. Astley and Mr. Scott, with myself, to go in Mr. Astley's carriage to the Excise office, and seek an interview with the Commissioners, without saying why I wished it; which if that conference had been

granted, I intended to have given them, the Commissioners, the opportunity of *gracefully* recalling their *tyrannous* decision, by showing them the section of the Act. But no! the solicitor, earwigged by the interested Excise officers, treated us as if we were paupers, and induced the Commissioners to refuse us an interview; which so irritated me, that I said to my friends, "Come away, let us go and apply to these gentlemen's masters." Mr. Astley and my friend were much vexed at what they considered was hasty impetuosity of temper on my part, which they said would ruin the cause; but when we were again in the carriage, I showed them the section of the Act, which astonished and delighted them. I proposed drawing up a memorial referring to this section, for presentation to the Lords of the Treasury; which I did, and sent it to Mr. Astley, after I had shown it to my friend Scott. I went to Mr. Astley that evening, 17th Sept., 1819, who had a person there to make a fair copy, which was signed by him, my friend, and parties belonging to the two Theatres Royal, presented to the Lords of the Treasury, who immediately ordered the men in possession to withdraw, and gave directions that the Board of Excise should pay for any damage or loss such seizure had occasioned. Thus, through me, were all the theatres relieved, probably for ever, from this annoyance, and the poor

fishermen upon the coast, who were often mulcted by some Excise officer for painting their old sails as floorcloths for their little rooms, may do so now without danger. Yet I never demanded or received any reward whatsoever, nor even accepted the price which the old Act of Parliament cost me; certainly I and my family were free of Astley's and my friends' theatres whilst in the hands of the then proprietors.

With a view to placing the Commissioners of Excise in a good position with the public, a statement appeared in the papers on the 12th of November, 1819, that "the Supervisors of the Excise have for some weeks past had their officers in possession of the scenery in the different theatres; last week the question was decided by the Honourable Board of Excise, in favour of the theatres."

This is wholly *false;* the facts are *exactly* and *truly* as I have stated, and I have the documents to *prove* them, and the conduct of the *then* Commissioners is most strictly true; and as those documents will show, I have told the plain unvarnished truth.

I remember a Mr. H——ds, as a good-looking and pleasant gentleman, a frequent visitor at our house, who I think had some dealings in corn or malt, and some of his descendants are still influential inhabitants at Dartford. Some time after we left this part of the country, he (Mr. H.) was returning from

London, with a friend in his (Mr. H.'s) chaise, when about three miles from his home he was attacked by seven footpads; Mr. H. shot the man who held the horse's head, the animal ran away into the next village, an alarm was given, parties went out, and found the wounded man in a chalk pit, stripped by his companions, and nearly dead. Medical assistance was immediately rendered, and the robber stated that their gang consisted of about seventy men, but he would only impeach the dastardly companions who had treated him in such a cruel manner. The six men were taken, but before he could legally identify these fellows he expired; and as nothing could be brought home to them, they were reluctantly discharged. Mr. H. received many threatening letters, supposed to emanate from the gang, and he never went out unarmed with pistols. One afternoon, in walking home from Crayford, two men begged of him; he gave them some halfpence, but immediately after thought he recognised their faces as being two of the six who had been taken up, and as they were following him closely, he took his pistols from his pocket, and said, "I have seen you before my lads, and I do not like you; now either go before me into Dartford, or go back." They chose the former alternative, and he thus by his determination probably saved his life, and was afterwards left in peace.

Some time before we left our delightful home, a succession of farewell dinners, or suppers, were interchanged between my family and our local friends, at which I was always present. One of these entertainments was at the house of a Mr. Latham, our medical attendant, and he amused us in the evening with some experiments in electricity, which made a great impression upon my mind, young as I was, and induced me to study the science when I became older; and I think it can be proved, that I have carried its successful medical application far beyond any other person.

At last came the sad morning of our departure. The chaise was engaged to go throughout, as we had much luggage; and after travelling post about thirty-five miles (no trifle then), we arrived, one chilly night in the month of April, at cheerless furnished lodgings, where everything was so different to the happy home I had left, that I felt quite wretched, and went to bed with a very heavy heart. In the morning I accompanied my parents to see the village, the mill, and its dependencies, and to look for a house. My mother felt so acutely the difference between our former and present situation, that, in the bitterness of her heart, she declared this village must be the very last place which was created, when everything good had been used up.

My father was very anxious to have a garden; there was a large piece of ground belonging to the works, but the last proprietor had had it made into a succession of fish-ponds, supplying them with water from the navigation which was the head of the mill, conducting it through the several ponds, and letting it pass out into the water which led to the tail of the mill. These ponds he stocked, at great expense, with carp, intending to assist in supplying the London market with that species of fish; but the winter brought the usual tremendous floods, common to that locality of the Thames, and the carp escaped into the river, which formed the backwater, and that stream became well stocked with them. When we first saw the land by the mill, nothing could be more desolate; there were four or five large apple trees, a walnut tree, and the rest large excavations with a little water in them, separated by wide banks; a very unpromising state of the ground to convert into a garden. My father, nevertheless, drew a plan of the ground, and made his calculations; and as his management may give to others some useful information how to make the most of unpromising ground, I will state them.

He marked out one broad walk the whole length of the ground, and cross walks; all these he caused to be trenched six feet deep, and threw the loamy

mould into the fish-ponds, mixed with many barge-loads of road scrapings, and other manure, which made with the natural loamy soil most prolific ground. The trenches made for the walks he caused to be filled with clinkers, ashes, and scoria of the iron, covering the whole with a thin coat of road-scrapings, which made them very dry and firm. He cut down two, and lopped some other large horse chesnut trees, which he had made into wattles to protect a quickset hedge, which he had planted within them; put up a door-case and a door, with a lock, which caused persons who knew the locality to smile, and assure my father that he was only providing abundant vexation for himself, for that the bargemen, who continually passed by the side of his embryo garden, between their vessels and the village, would never let him enjoy the produce of it. My father proved that these opinions were badly founded; for as soon as the garden became productive, which it was very soon abundantly, my father freely offered these men, as they passed, vegetables or apples, and none of them ever took even an apple without permission; indeed, had any one of them done so, he would have been scouted by the rest of his companions.

When my father first entered upon the mill, he found the workmen very irregular in their habits,

and drunkenness was of common occurrence; but he was a man to whom might be applied with great truth, the line *suaviter in modo, fortiter in re;* and having brought his foreman and deputy-foreman, from his other works, he made it known as his irrevocable determination, that he would immediately, and for ever, dismiss any man who became intoxicated a *second* time, during the period when he ought to be at work; for though it was no injury to the concern in a pecuniary point of view, because the men were paid by the quantum of work performed, yet it was an injury to the other men if one of their number was incapable of taking his share of the duty, as they were obliged to have a man from another branch of the works as a substitute. The *first* time any workman became intoxicated he was fined, had to pay his substitute, and was wheeled to his lodgings or house in the village, in a large barrow, the bell of the mill tolling all the time. Under my father's judicious management, the workmen became steady, and most of them respectable householders in the parish; some kept a cow upon the common, pigs, and poultry, until the rage for inclosing, got up by country attornies for their own especial benefit, reached this village: many were deprived of advantages enjoyed for ages by their ancestors, and some died in the village workhouse in consequence of losing them.

Our residence was about three-quarters of a mile from the works, and in going there we had to cross a tolerably wide river, the backwater, on a foot-bridge about two feet wide, placed high above the water, on account of the floods; numberless bleak sported below. I caught and killed a large quantity of house flies, and when I went with my father I was much amused, and I believe so was he, by seeing the fish take them. Sometimes I threw in a large blow-fly, which would go down the river a considerable way, and then disappear with a sudden plunge; these I soon learned were taken by chub. I bent a pin, tied a long piece of fine thread to it, put on a fly, and dropped it over the bridge; the bleak came up and looked at it, but were not to be caught by such clumsy tackle. At last, one day, just as my fly touched the water, a large bleak, more careless, or more hungry, I suppose, than the rest, took my fly, bent pin included; my heart beat quickly, I pulled him nearly to the top of the bridge, when, to my great disappointment, he fell off, and this was my *début* in angling. I told one of my father's men, an experienced old fisherman, of my loss, and he gave me a small fish-hook tied on hair; this I attached to my thread line, and baiting with a bluebottle fly, I had the great triumph of hooking and killing a chub about six ounces weight. I was then seven years old, and thought myself a

very clever angler, only wanting proper tackle to become first-rate.

Mr. Alladay, the lock-keeper at Thames lock, who devoted his leisure to angling, told my father there were plenty of carp in the backwater, but that we must fish for them early. My father said if I would get up at six o'clock the next morning, he and I would try if we could catch some. Accordingly worms were provided, and tackle which had served for flounder-catching at Dartford, cork floats, bullets, &c., were produced, and we had a spell of three hours without a single nibble, when Mr. Alladay coming to see what sport we had had, soon convinced my father that fishing for *flat fish*, and fishing for carp were different things, and required tackle of a kind my father, who had no knowledge of Izaak Walton or his art, was wholly unacquainted with. Mr. A. gave us some hooks, we bought better floats, and in the afternoon my father, mother, and myself, seated in chairs, tried our skill again in another part of the river; we caught two or three flounders, and some little eels, and there ended my father's attempt at angling. I, by degrees, under the tuition of Mr. A., managed to capture gudgeons, roach, dace, and chub; from him I learned the qualities of gut, hair, and hooks, how to make my own floats, and other tackle, tie on hooks, &c., and the advantage of ground

baiting. All my pocket money was expended upon these objects, but I had to encounter the opposition of my father, who having been unsuccessful himself as an angler, and being devoted to his garden, looked on angling in a very unfavourable point of view, and what with my attendance at school, and my father's discouragement, my pursuit of piscatorial knowledge was enveloped in difficulties. My mother having given my father another son, never angled but once, and that was on the occasion of a visit of a friend from town, when I went with him and her in a punt gudgeon fishing in the Thames, I being occasionally allowed to hold one or other of the rods.

In 1780, the No-Popery riots took place in London, and a Mr. L——, whose house and furniture were burned, and he himself escaped with difficulty, he being a Catholic, was sent by the firm in town in which my father was a partner, for shelter in our house. My mother dispatched me to my father, who was at the works. I took with me my bow, which was a most excellent one, and some sharp, steel-pointed, and feathered arrows. I had crossed more than half the first enclosure of the paddock, when a bull who was there grazing, espied me and gave chase. I ran for my life, and reached a high stile over which I was in the habit of pitching a summersault, throwing my bow and arrows first over;

but I never performed that saltatory feat so quickly as I did on this occasion. When once over, I knew I was safe, and waved my bow at my enemy, and struck him on the horns with it gently, so as not to injure my bow; he, finding his attempt useless, retreated a little way, and stood watching me, stamping the ground. I, to revenge myself for the run he had given me, and the fright he had occasioned, fitted one of my sharpest arrows to my bow, and sent it with all the strength I could command into his flank, which made him run and bellow to my great satisfaction. I searched for, and found my arrow a day or two after, when the bull was removed to another pasture; but I had bled him tolerably well, as was evident by his hide. About a year after that, a strong active young man, one of our workmen, determined to cure this bull of attacking people, contrived to dodge the animal round a tree, caught hold of his tail, and beat him with a flat piece of oak paling which he had prepared on purpose, till the bull fairly sunk on the ground, partly with fright, and partly with exhaustion,—the workmen looking out of the mill windows, laughing and cheering their companion; after that, the animal was as civil and well-behaved a bull as any person might wish to meet: but he was very careful to avoid any proximity to man. Discouraged as I was in my favourite pursuit by my

father, I did very little more than look at others enjoying it, treasuring up in my own mind everything worth remembering, until I was about ten years of age, when looking in the book-case of an old gentleman, a neighbour, and intimate acquaintance of my family, I found an excellent edition of Walton and Cotton's Angler; this I borrowed and read, until I had impressed it upon my memory, and having had the present of a solid rod, winch, line, &c., I now and then obtained permission from my father to angle for an hour or two, as a reward for performing an abstruse arithmetical calculation, or making a correct drawing of some geometrical figure, and giving a correct calculation of the contents of its area. One day, whilst standing rather insecurely on a narrow piece of planking, I hooked a large fish, and the sudden impetus given to me, caused me to fall over into the river; the water was rather too deep for me, but the depth only extended a little way. I held on to my rod, and aided by the pulling of the fish, and by my own paddling with one hand, I got on a bank of sand in the middle of the river, where the water was only about two feet deep, and there I stood, and played my fish, which turned out to be a barbel, weighing nearly five pounds. One of my father's men waded off to me, with a bushel-basket in his hand, a common substitute at the works for a landing-net; he carried me

through a deeper part ashore. I went to the porter's lodge, got into his bed, between the blankets, whilst my clothes were being dried at the furnace-fires, and my father never knew I had been in the water till some years afterwards. All of us, except my mother, enjoyed our barbel, baked, with a pudding in his belly, with some savoury gravy; and a friend of ours having come from London to our house, on an angling excursion, dined with us, and anticipated what rare sport HE should have with his beautiful tackle, if a boy like me could take such a fish. I had three or four holidays to go out angling with him. I shewed him all the best spots, and we had capital sport; when he went away, he gave me quite a stock of tackle, so that I was completely furnished as an angler for bottom fishing; and my father, after the visit of our friend, did not object to my reasonable use of the amusement, to which he saw I was attached.

Amongst my father's men, there was one who had been all his life-time a fisherman, and I *now* believe was not very particular *how* he caught fish, so that he only obtained them. We had a great number of pike in our waters, and large eels, which were very destructive of other species of the finny tribes. This man taught me how to lay trimmers, and I often succeeded in taking pike from three to eight pounds in weight, and eels two to three pounds. When I came

home for my holidays in winter, I used to shoot snipes, wild ducks, wood pigeons, starlings, &c.; and in summer, I angled with great success for barbel, chub, roach, dace, and gudgeons. The Thames fishermen often came up our back-water with their nets; my father, therefore, had piles driven into the bed of the river, rails laid across, and a gate, through which I could go in my boat; the gate was secured with a chain, and lock, with copper wards, which effectually blocked all persons from coming into our waters. I had not yet caught a carp. I refrained from all other angling for a whole month, endeavouring to catch one of these cunning fish, without success, though I tried all the scents, and different things I read or heard of. I had seen them taken close to me by a person who performed the bricklayers' work for the mill, with tackle very much inferior to mine. I observed that he kept throwing in small pellets of paste, which he took out of his pocket,* but that he baited his hook with paste out a horn that hung to his button. I asked him for a bit of paste; he put his hand in his pocket to give me some, but I took a piece out of his horn, saying, "this will do." I put part of it into my mouth, and found out the secret,—

* See Oppian's Halieuticks, Book iii. verse 625. The ancient Greek fishermen threw in a shower of pills made of odorous cheese and flour, formed into a paste, and baited their hooks with the same,—he does not say for what fish.

it was made up with honey; after that, I could catch carp as well, or better than him. To make this paste your hands must be very clean, and well rinsed from soap; dip a piece of wheaten bread that is a day old, in clean water for a moment, then press, and squeeze, and work it up into a stiff paste with honey; ascertain the depth of the spot where you propose to angle the day before, and make a mark so that you may know whether the water have risen or fallen; ground-bait the place with bread made into paste, mixed with a little barleymeal, and a *small* quantity of honey, the night, or even two nights before you angle; your hook must be short in the shank, and the hook should be hidden by the paste; the whole bait should be about the size of a marrow-fat pea. You must approach the bank very quietly, not too close, drop in your bait gently, and let your rod lie down; the shot should nearly rest on the bottom, but not quite, so that your float, which should be very light, will have its lower end a little depressed; the bait will be about nine inches from the shot; the gut must be fine, but round and strong: throw in, one at a time, very quietly, little pellets of plain paste, about the size of peas. Angle in a still place near an eddy, in from four, to six or more feet of water. The carp will suck in the bait, the end of the float will dip under water. As soon as you see this, carefully, and

without shaking it, put your hand to your rod, and in a second or two after, the float darts off; then firmly, but not violently, only with a mere turn of your wrist, strike, and the struggle commences; the fish will endeavour to run in amongst roots of trees, if there be any near, and if large, will put your skill to the test. On the front of the dorsal or back fin, the bone is like a sharp saw. When he is hooked, he will make many very short turns in his endeavours to escape; and it is possible, that the line, from bad management on the part of the angler, will, in some instances, pass across this bone, and if so, will be instantly severed.

An angler should calmly watch the route the fish he has hooked takes; let him have more line as may be absolutely necessary, and wind up whenever practicable, with safety; be in no haste to see the fish, for many a good fish has been lost through the angler throwing himself into a flurry; and be cautious to play your fish away from the spot where he was hooked, or other fish near will be driven away. This you can easily do as soon as you strike him, probably in consequence of the surprise the fish must experience, at having his motions so suddenly controlled.

I have had excellent sport in taking barbel, sometimes from six to twenty in a day. The largest I ever took, weighed above ten pounds; and the

heaviest I believe on record in England, was one taken in the river Lea, weighing nineteen pounds. But Cuvier says, in localities favourable to them, they will grow to ten feet long. In the Danube, during the autumnal equinox, ten to twelve tons are annually taken.

In the Volga, a river of Russian Tartary, the largest river in Europe, and which I shall have occasion hereafter to mention, barbel are taken more than four or five feet long, weighing from thirty to fifty pounds; the air bladder of these fish the natives on the banks convert into an inferior kind of fish-glue, or isinglass; their roe they either throw away, or boil and feed their geese and other poultry with it; for though it is inimical to the human race, it is not injurious to birds of any kind. Barbels are sold there at about nine pounds, English, per thousand.

The beljugas were sold at Astrachan at so much a hundred pieces, which are thus reckoned: a fish of eighteen to thirty-six inches long, from eye to tail, is reckoned as one piece; those under eighteen inches long, two for one piece; one of thirty-six inches counts as two pieces; thirty-nine inches for three pieces, forty-two for four pieces, and so on. A hundred of such pieces of this fish at the first hand *then* sold for seventy or seventy-five roubles, or £15 15s., to £16 17s. 6d. Sewrjugs, without being measured,

were sold at ten to fifteen roubles per hundred, or £2 5s. to £3 7s. 6d. Barbels were valued at forty roubles per thousand, or £9.—See Travels of Dr. Pallas.

Four gentlemen, named respectively, Emes, Atkinson, Hall, and Moore, on the 9th of August, 1807, in Shepperton Deeps, the two first in one punt, caught forty-two barbel, weight 80½lbs; the two others, in a second punt, caught forty-five barbel, weight 70½lbs. It has been said that two hundred weight of barbel, from one to fifteen pounds each, have been caught with one rod in a day. I think it must have been a *long* day, not beginning as the above four gentlemen did, between ten and eleven o'clock in the morning.

A barbel taken in the old river Wey, or in the navigation from Weybridge Bridge to Thames Lock, of twenty inches long, will weigh more by a pound, than one of the same length taken in the Thames, and the former is much more firm, fat, and better flavoured than the latter; this may be accounted for by the great quantity of horse mussels there are in the Weybridge navigation, and the old river, and thence to Byfleet; these mussels are of large size, and when they are moving from one place to another they expose so very large a portion of themselves outside their thin shells, which no doubt proves tempting and nutritious food to any fish; for on the

water of the navigation being drawn down, the immense number of empty shells, evinces the correctness of this opinion. Barbel are best in season the latter end of summer, before the weather gets too cold, as they then retire, if they can, into brackish water, or deep holes. It is a very pleasant way of angling for them with a large float, where the bank is excavated under; let your bait be within half an inch of the bottom; bait with maiden lob worms, or three or four gentles, or chandlers' greaves, broken into pieces, in cold water, then put on the fire and allowed to simmer up once; select the fine white pieces.

These fish spawn in April or May, each female giving out from seven to eight thousand ova, or eggs, which vivify in nine or ten days, as it is said, but I do not believe that any egg vivifies in so short a time, it being proved salmon take ninety-four days; the parent fish recover in about six weeks, and are in prime season the latter end of July, August, September, and if fine, to the middle of October. In fishing with a float, strike the moment it is pulled under; in angling with a ledger bait, a large round, or oval bullet is better than the flat leads, because the former rolls about, and by keeping the bait moving, attracts the fish sooner.

If in ledger fishing you feel your rod shake *once*, you seldom hook the fish, though you strike ever so

rapidly, but generally lose the worm, for the barbel will take hold of its head, and strip it clean off the hook; to prevent this, have a smaller hook whipped on the gut, a little above the larger one, and hook the head of the worm on that, and you will sometimes catch the barbel with that hook. It is the natural instinct of all fish, many birds, and reptiles, who, if they do not seize their prey by the head at first, always turn and swallow it headforemost. When a barbel gives two or three pulls, strike quickly, and you are tolerably sure to hook him. If you angle late in the evening, with two rods from a bank, place a small squirrel's bill on the point of the rod which is lying down.

The improvement in the navigation of the Thames has caused a great deterioration of it as far as angling is concerned; when a boy, I have gone into an osier ait, with a tolerably long rod, a short line, a few cockchafers, and screened by the leaves, could pick out of a shoal as many chub as I chose; or more recently, with an artificial fly, I have filled a large bag with dace, six to eight ounces each, and chub from one to five pounds; besides occasionally, though rarely, a trout of a pound, or pound and a half, during a walk by the side of the Thames from Weybridge to Sunbury. The most expert angler could not do one quarter, or a sixteenth as much at the present day.

In 1824 and 1825, a Select Committee of the House of Commons was appointed to enquire into the state of the salmon fisheries of the United Kingdom (from which and other authorities, I have extracted the observations on salmon). They examined in the course of thirty-six sittings, at very great length, many most intelligent witnesses; amongst others, Mr. John Halliday, George Little, Esq., and the Reverend Dr. John Fleming, minister of Flisk, in the county of Fife, a great naturalist, who had published some works on the natural history of fish. He mentioned seven species of the genus Salmo, that inhabit, or frequent the estuary of the Tay, viz.,

1. Salmo salar,—or common Salmon.
2. Salmo hucho,—presumed to be the bull Trout.
3. Salmo croix,—the grey or shewn.
4. Salmo trutta,—the common sea Trout.
5. Salmo albus,—the Whiteling, or Finnock.
6. Salmo fario,—the common river Trout.
7. Salmo eperlanus,—the Spirlin, or Smelt.

Some of these are migratory to the sea, and the others not: those which frequent the sea, are found full of roe in August, September, and October, and deposit their spawn from November to January. In the first of these three months they pass up the mid-channel, almost always, of the river wherein they were bred, or had been accustomed to frequent;

should an insurmountable obstacle present itself to their passage upwards, in the main stream, or anything occur to alarm them, they will pass up any tributary stream, from whence fresh water flows; and it is well known will make repeated and astonishing leaps, to arrive at a fit place to deposit their spawn: the male is equally prompted by instinct to make the same exertions. This accounts for the salmon leaping into the mill, and the one taken in the fresh water which ran in the road-way, mentioned in the former pages: and many a noble salmon being dashed to pieces in the attempt to pass the wheels of the mill, in order to arrive at the fresh water, as I have before stated.

These three gentlemen, the two first from an experience of forty years each, coincided in positively stating to the committee, that one male salmon associates himself with one female fish; that they play together for a short time, either very early in the morning, or late in the evening, round their intended spawning ground, which they have selected as fit for the purpose, and then together make a furrow, by working up the gravel with their noses, against the stream. When that furrow is completed, they throw themselves on their sides, and, rubbing against each other, are mutually stimulated to shed the eggs and the milt simultaneously, into the hollow they have made,

which they carefully cover with loose gravel; they then proceed to make another furrow, and the same process is repeated, until the whole of the eggs of the female are excluded, amounting to from seventeen to twenty thousand; these being dropped singly, occupies several days.

The horny excrescence at the end of the lower jaw of the male, is only a character of his sex, and not as has been supposed, to enable him to make the above furrows in the gravel, for both male and female work to make them; probably, if any difference, the male most.

Should the fish be disturbed, or frightened away from the spot where they have begun to spawn, they return to it as soon as the cause of their alarm has ceased; and in the case of the male fish being captured or destroyed, the female leaves the place, and seeks a deep pool, from whence she soon returns with another male partner, who aids her in completing the work; and this she will repeat several times if her then male partner be taken away. Poachers are so well aware of this fact, that they constantly take the male fish, which is then easily done, always allowing the female to escape, who thus becomes a decoy for them. Mr. Young gives an instance of a female salmon, from the side of which nine male salmon were killed in this manner; she then repaired

to the pool, and brought with her a large male common river trout, when the poacher leistered, *i. e.* speared, both of them. So that this fish had a disposition to have a hybrid progeny; but the poacher being, no doubt, a man of *great moral rectitude*, would not allow of any such *disgraceful* proceedings, and so took the lady away from the temptation of doing so again. It is a matter of speculation for the naturalist how fish communicate with each other, and how this female salmon seduced nine salmon to their ruin. Examples of a similar kind are too often to be found amongst the human race.

It appears from the evidence, that the eggs remain covered with the loose gravel for several weeks, and they first show signs of life by a very slight fin, attached to the egg, appearing above the gravel; the egg has considerable motion by means of that fin, and so probably becomes emancipated from the place where it was deposited, unless, as I have suggested, the female returns to assist in the work.

The evidence of Messrs. Little and Halliday go to prove that they have detected something like amorous passions in the salmo genus; and if Oppian is to be credited, and he was a very acute observer, many fish have a predilection for a particular mate of the opposite sex, some are constant to that one, others keep a complete seraglio, and guard it with most jealous

care; and again, there are a few species which are attracted by and follow promiscuously any of the females to their own ruin. Fishermen of that period, sixteen hundred and fifty-two years ago, understood these propensities of fish, how to take advantage of their passions, and to thereby entrap them. The above author devoted nearly half the first book, and almost all of the fourth of his Halieuticks, to the most curious description of the loves of the fishes, whose desires, he asserts, are more ardent than those of terrestrial animals.

Francis Willoughby, who wrote in 1686 a most elaborate folio work in Latin, giving an account of all fishes then known, with plates of them, mentions a species of salmon, denominated by him "*salmo griseus*," or the grey; this fish was then scarce, and was considered so much more delicate than the salmon, as to command more than double the price. Another author, who wrote above a hundred years ago, describes this fish as being equal to the salmon in magnitude, but very unlike in shape, being considerably broader and thicker, the tail as large, but not forked, the body stained everywhere with grey or ash-coloured spots, whence he supposes it takes its name. He confirms Willoughby as to the superior excellence of this fish, and the consequent price it obtains; he says they enter the rivers from the sea

with wonderful swiftness, and surmount almost all obstacles with the greatest ease, by their superior strength and agility; they come into the fresh water early in August to spawn, that they are seldom taken, and are therefore known to very few persons; they have never been caught with any bait. He thinks it is the same fish that is known in some parts of Scotland by the name of the "*grey lord.*" This appears to be a valuable species of fish, but it is to be feared is now extinct. In the Volga are large quantities of what are denominated white salmon; probably these may be the fish called by Willoughby "*salmo griseus,* or the grey."

The analogy between salmon and birds will, after reading the evidence of Dr. Fleming, Messrs. Little and Halliday, be very striking. Birds pair, make nests for their progeny, and deposit their eggs as much out of sight as possible; salmon make furrows, and conceal their ova. It appears that one species of fish make nests, and it may be that others do so whose habits are not yet discovered;* but, for want of more acquaintance with the habits of fish, at present we can go little farther with the analogy.

It had long been believed that female fish shed

* In an early volume of the Edinburgh Philosophical Journal, there is a curious account of the nests made by the *Gasterostèus Spina-tria* of Linnæus (a peculiar species of stickleback).

their spawn when it arrived at complete maturity, and that any male fish indiscriminately endued it with the germs of life, without contact with the female; the evidence adduced before the Committee of the House of Commons, *proves* that this opinion and belief was unfounded in fact; and some future scientific naturalist may discover whether the female fish returns to the spawning bed, and assists to emancipate the young fry from the gravel; for it appears she does not go down to the sea for some time after the eggs are vivified, and if, as the evidence shows, the female salmon have sufficient knowledge, or instinct to seek for a fresh mate, when the first, or other succeeding ones are taken away, and to conduct him consecutively to the same spawning bed, it is not unreasonable to suppose that she may have instinct enough to perform that service for her progeny; and the tales told of fish eating their own spawn, may arise from the misunderstood efforts made by the female fish to attain the above object. The work of E. and T. Ashworth, Esqs., with which they have favoured me, p. 46, however, appears to show that the females are the greatest enemies of the young fry, and the males the most zealous defenders of them.* This, *if*

* See Treatise on the Propagation of Salmon and other Fish; published at Stockport, and by Simpkin and Marshall,

true, (?) is contrary to all known laws regulating created beings. Instances are often occurring of terrestrial animals, when disturbed in parturition, eating some of their young, but these are exceptions to the general rule.

The male salmon as well as the female, are driven to seek the fresh water, not only for the purpose of propagating the species, but in order to free themselves of the parasitical insects which annoy them,—the *Monoculus piscinus* of Linnæus; but Dr. Fleming does not entertain that opinion. How then are their violent desires and exertions to get into fresh water to be accounted for? Do salmon pair before they leave the sea? Dr. Fleming admits that the *Lernæa Salmonæ* of Linnæus infests the gills of salmon very much, even to eating away a great portion of the gills, if they stay too long in the fresh water. These insects are vulgarly called maggots; but, according to Dr. Fleming, very improperly so, as they do not change their state. Salt water removes them, and cures the fish; therefore, instinct, or some reasoning faculty, induces them to return to the sea.

The generation of fish, as well as of all animated creation, if the subject be rightly considered, cannot fail to excite wonder in every mind capable of reflection. Those who have been blessed with the advantages of education, are better able to appreciate the

stupendous arrangements of the great Architect of the Universe, and are capable of investigating the subject more closely; they must be impressed with greater and more profound veneration for, and admiration of, the great beneficent Supreme Being, as each arrangement of his bounty and goodness becomes developed to their view.

The first male and female of every living creature, contained in themselves the germ from which all of that species were in future to be produced. Referring to fish, if it be possible, take a male fish as early as his sex can be discovered; let him be placed where he cannot see, or have contact with any other fish, yet has proper food; do the same with a female: as soon as she attain, even a comparatively trifling age, the female will have within her the roe or eggs, and the male the milt; shewing the inherent principle of reproduction in each, yet such reproduction cannot take place, unless the ova be vivified by the male. To keep the male and female apart, we know there would be no yonng fish in this case; but it would be an illustrative experiment, to ascertain the effect produced on the health of both these fish.

It is affirmed by the fishermen of the Volga, that they sometimes take fish of the sturgeon species, which are hermaphrodites, having a milt on one side, and a roe on the other; the same thing has been ob-

served in Holland amongst the chevins or large cod fish. This is a curious fact for the investigation of the naturalist. But how it is to be accomplished is the difficulty, as only by considerable and most close observation it could be ascertained, even if it were possible at all to ascertain whilst the fish were alive, whether it were in such a state? If that could be done, the fish might then be confined, and it would be seen whether it had any productive power.

Every judicious gardener knows, in backward seasons, when there are no bees abroad, that he must fructify his melons and cucumbers, by introducing the farina of the male flower, to the female flower. It is a very plain example of the inherent reproductive property of flowers, to shake the fine farina from a sunflower, which is indeed so minute that it can scarcely be seen with the naked eye; place this under a very moderate power of the microscope, and every single speck is a perfect sunflower, with its leaves and farina, in miniature; but no seed will be produced unless the farina of the male flower be wafted by the wind, or conveyed by insects to the female flower. To bees, and other winged insects, man is much indebted, for conveying the farina of the flowers of fruit trees to those of the opposite sex; in which process the wind also very much assists; indeed, without these aids, female flowers would bring forth

neither seed or fruits. Animals in like manner kept sexually separate from each other, lose their energies, or become diseased, or soured in temper, and often die early. In the human race, where the forms of the world, or other circumstances arising in civilised society, prevent the laws of nature from being fulfilled at the proper season, great nervous irritability, even extending to insanity, or a state of occult disease a little removed from it, shewing itself in a disposition to regard every circumstance of life in an unfavourable light, or some more apparent malady, total, or partial privation of one or more of the senses, is almost sure to occur. That a great cause of insanity may thus be traced, is a well-known truth amongst those of the professional world, who have the supervision of lunatics.

The experiment I have alluded to, of keeping the two sexes of fish apart, would probably develope a curious physiological fact.

Fifty years ago, when the water of the Serpentine river was quite clear, angling in it was an exclusive privilege possessed by few; all beyond the superintendent's house was a green bank down to the water, to which the road was over the foot-bridge by the guard-house, which idlers, and those who had no right there, were not allowed to pass. I was one whose name was inscribed on the free list. The roach then

were from six ounces to three quarters of a pound, or sometimes a pound each, and they were eager after a well-prepared bait. I often took carp from four to six pounds each; tench, from one pound to two, and once, a tench weighing five pounds three quarters; and eels, one to three pounds. I do not think there have been *any* pike in this water for many years, or I believe *many* perch: of the latter, one was taken in the year 1800, as one of the keepers (Bonham) informed me, weighing nine pounds; but though I fished there during several years, I only took two of the weight respectively of one pound, and one pound and a quarter. Bonham also stated, that about 1796, a pike was taken nearly on the opposite side to the receiving house, in a most curious manner. As a footman was walking by the side of the Serpentine one morning, very early, he saw something struggling in the weeds near the shore; thinking it was some one drowning, he rushed into the water, and found it was an immense fish, nearly powerless; the man got beyond the fish, and gradually lifted him nearer the shore, and at last threw him out. It proved to be a pike, that had attacked a carp of nearly seven pounds weight, which, in endeavouring to swallow, had stuck fast in the throat of the pike, and disabled him; on being weighed, he proved to be more than thirty pounds. I have not angled in the Serpentine for

many years; for since a road has been made beyond the receiving house, the annoyance of the questions of curious promenaders, and the hosts of blackguard boys looking out to see what they can steal, and the state of the water, effectually prevented me from doing so; independent of which, the fine roach which used to be there, are supplanted by a sort of hybrid, apparently between a crusian carp and a roach, or a bream and a roach; they are extremely numerous, may be taken in *any* number, and from being very bony, are useless when caught. It would be an excellent plan to turn two or more pike in, of a good size, to fatten upon these myriads of fish, which eat the food that ought to support more valuable kinds; but in placing pike therein, care should be taken to have all of one sex, otherwise, the water would soon swarm with young pike; and as the large ones should only be put there for twelve months or so, the state of celibacy during that period would not injure the fish; when these were fat, they might be caught, and others placed to undergo the same process.

The fecundity of fish is truly astonishing. Professor Blumenbach states, that there are more than two hundred thousand eggs in a carp. M. Petit found nearly three hundred and fifty thousand in a tench, three hundred thousand in a perch, twenty-five thousand in a pike, above fifty thousand in a roach, sixty

thousand in a smelt, six thousand in a shrimp, twelve to twenty-one thousand in a lobster, four thousand in a crab, thirty-six thousand in a herring, one million in a sole, the same number in a flounder, of a large size, above one million four hundred thousand in a sturgeon. This account of the fecundity of a sturgeon must apply only to those of southern climes; for in the Volga, where this fish is from thirteen to sixteen feet long, and the weight of 1200, 1800, or 2300lbs., two hundred pounds of roe have been taken from one fish; now, as Dr. Pallas asserts that five eggs weigh only a grain, it is easy to calculate that the eggs in this sturgeon were seven millions! But this is nothing compared with one caught in that river in the winter of 1769, seventeen feet long; weight, 2,500lbs.; from which were taken 720lbs. of roe, which, by the same calculation, would give 25,200,000 ova.

To take fish of the large size mentioned by Dr. Pallas, called the beljuga, or bjeluga sturgeon, a species of trap or weir is constructed. Another method is to ascertain where the fish are lying side by side in a state of torpidity, in deep holes. Make apertures in the ice, and with long poles, having a large sharp hook at the end, disturb them, and as they rise, the fish are hooked, and drawn up on the ice; if too heavy for one fisherman, others assist.

A third method is by netting. Upon one occasion (as described in Trusler's Habitable World, vol. ii. p. 189), five hundred of these fish were taken; the generality of which were thirteen, fourteen, to twenty-three hundred weight each.

A fourth mode of taking them is by strong lines and hooks, baited with a small fish, called in Russia *Obla* (*Cyprinas Griflagine*).

All these modes are adopted at certain seasons, and under strict regulations. In winter, those fish caught, are sent on sledges, frozen, to Astrachan, and 100 of these fresh beljugas then sold for 120 roubles, of 4*s*. 6*d*. each, or £27. Of the roe of the female fish, the cavear is made thus: the roe is pressed through a coarse sieve, to cleanse it from the skins and blood-vessels; one pud of roe placed in a trough, will take five pounds of salt; it remains in the trough an hour; it is then spread over fine sieves to drain away the brine, and then pressed down into barrels; this is the *granular* cavear, and sold at one rouble, eighty copecs (or kopecks) the pud, or 7*s*. 10*d*. English. There is another kind of cavear made thus: the roe is separated from the skins and blood-vessels, is placed for half an hour in strong brine; it is then taken out, and laid on sieves to drain; then put into pointed bags, like jelly bags, each bag containing 18lbs. In these bags it is squeezed till all the brine is out; it is

then placed in barrels, and trodden down by a man wearing leather stockings. The casks are well secured against leakage, and this cavear sells for two roubles the pud. A pud *then* was 40lbs. Russian, 36lbs. English. A rouble was then 4*s*. 6*d*. English, and a copec one half-penny; now, the value is very different.

No part of these fish is lost except the lower part of the abdomen and bowels, which are thrown away. The fat off the milt from the male fish is scraped thence with knives into a pail, it is then boiled and cleaned. This fat, when fresh, is very good tasted, and may be used instead of butter or oil. In Astrachan it is sold from forty to fifty copecs per pail, then 1*s*. 8*d*. to 2*s*. 1*d*.; but how much the pail contained is not stated.

In the Caspian-sea fisheries, the beljuga stone, which (Dr. Pallas says) has always remained problematical, is often found in the larger species of this fish, and commonly sold at the price of a few roubles; according to the fishermen's accounts, this stone, when found, is in a sac of the rectum. They are also found in the largest sorts of sturgeons; they weigh (he says) occasionally from one to three ounces, and may with difficulty be scraped with a knife: they are amongst other Russian domestic medicines, but he says it does not merit to be so placed. It is said to be the petrified roe of the fish.

There are more than nine millions of ova in a cod, more than half a million in a mackerel, and seven to eight thousand in a barbel. By the evidence given before the Committee of the House of Commons, as before mentioned, salmon have from seventeen to twenty thousand eggs, and trout probably, being of the same genus, have as many. But the quantity of ova varies according to the age of the fish; as an instance, a flounder of two ounces will contain 133,407 eggs, whilst one of twenty-four ounces contained 1,857,403. It must not be supposed that these enormous quantities of eggs are all vivified; many are greedily devoured by other fish whilst in the ova state, and many more immediately the ova attains vitality, and a very large proportion when they assume their proper character. A little well-known fish, called a stickleback or sharpling, which I have elsewhere mentioned, is most destructive of the spawn of all species; it is a matter of doubt, whether small eels or the stickleback destroy most spawn. It is unsportsmanlike to take any fish when full of spawn, for then man becomes a wholesale destroyer of fish by tens, or even hundreds of thousands; another practice is adopted by some persons of using salmon roe as a bait, a practice injurious to the breeding of this noble fish, and which cannot be too strongly reprehended, for hundreds are taken for the sake of the roe, which causes a diminu-

tion of millions of salmon,—and for what? Why, to excite a species of taste for cannibalism amongst that class of animals, and to gratify some would-be-angler, who has not skill enough to take fish by legitimate methods recognised by all true sportsmen! I have been told by a gentleman, upon whose word I think dependence may be placed, that a tackle-maker, who *professes publicly* to point out the necessity of protecting salmon from being unfairly caught by small-meshed nets, obtains, and sells 500lbs. weight of this roe nearly every year!

The liquor of the oyster, it is asserted, contains incredible multitudes of small embryo, covered with little shells, perfectly transparent, swimming nimbly about. One hundred and twenty of these in a row, would not exceed one inch. Besides these young oysters, the liquor contains a great variety of animalculæ, five hundred times less in size, which emit a phosphoric light. The list of inhabitants, however, does not conclude here; for, besides these last-mentioned, there are three distinct species of worms, called the oyster worm, half an inch long, found in oysters, which shine in the dark like glow-worms. A good microscope is necessary.

Amongst the voluminous evidence obtained by the Committee of the House of Commons, there is no mention of southern rivers; the fact is well authenti-

cated, that salmon were formerly very plentiful in the Thames; and the fishermen, within my recollection, added very materially to their incomes by the capture and sale of that noble fish, some of which were very large. I perfectly remember rowing off to see one in the year 1789, which was enveloped in nets between two punts, kept apart by short spars lashed head and stern. This fish was caught near Laleham, and the weight was said to be *seventy* pounds. Salter, in one of his publications, confirms the fact, and states that it was sold to Howel, a fishmonger in the Minories, opposite America Square, for one shilling a pound; shewing, by the price, the great plenty there were of them. Formerly, in walking by the side of the Thames on a summer's evening, anywhere above Sunbury, up to Windsor, you would see numbers of large salmon leap out of the water by the side of the osier aits, either in sport, or after flies. Now the locks and weirs are so unscientifically constructed, that if salmon were to run the gauntlet of passing the pool, their further passage upward would be completely obstructed by these badly contrived erections.

The salmon fishery of the Thames was anciently of very great importance to the inhabitants of the parishes upon the banks of that river, who appear to have had each an assigned "*room or rome,*" or bounds for their respective fishery. In the church-

warden's book of Wandsworth, under date 1580, is the following entry: "M. D." (presume memorandum) "That this yere in somer, the fishing rome of Wandesworthe was by certain of Putney denyed, and long sute before my Lord Mayor of London continued, and at the last, according to right, restored by the Lord Mayor and the Councell of London. And in this somer, the fysshers of Wandesworthe tooke betweene Monday and Saturday, seven score salmons in the same fishings, to the great honor of God."—From "Notes and Queries."

From a newspaper of July 1754. "Was caught at London Bridge, the greatest take of salmon ever known, whereby the price of that fish fell from one shilling, to sixpence per pound."—See "Bell's Life," August 22nd, 1852.

The ancient Greeks it is said, did not know the salmon, although they had the trout. In Macedonia, fish were caught, probably this species, (the trout,) with a fly, the mosquito, and the horse-fly; but their rods and lines were very short and imperfect, according to the measurement given by a recent author. Soyer says, salmon were known to the Romans, also the common trout, the white trouts, and the sea trout, perch, and gudgeon, the latter called by them *Gobio*. According to all naturalists whose works I have been able to consult, Soyer is in error, as no salmon have ever been found in the Mediterranean.

Greater attention has been given to this subject, as regards salmon, in the river Severn; a meeting of landed proprietors upon the banks of this last-mentioned river was held at Tewkesbury, on Wednesday, the 16th of December, 1840, relative to the proposed improvement of its navigation; Earl Beauchamp in the chair. Mr. Strickland stated that he had heard a paper read at a meeting of the British Association at Glasgow, describing a plan of making passages, which were called "staircases," by which the salmon were enabled to pass up the weirs; and he wished to know if the proposed weirs would obstruct the salmon, and so injure the fisheries, which were of great importance. Mr. Cubitt replied, that he believed the intended weirs would not obstruct the salmon; "that the *staircases* were a very neat contrivance," and they would be furnished, if necessary.

Whatever may have been the manner of constructing the weirs in the Severn, the fisheries have not, as far as I can learn, been injured.

Since writing this, I observed in "Bell's Life," of Sept. 3, 1854, the following, copied from the "Worcester Chronicle."

"SEVERN SALMON.—The take of Severn salmon has never been so great as during the present season. In three days in May, 200 prime fish, weighing 1050lbs., were brought by the fishermen to one of

the principal fishmongers in Gloucester, and 250 in another three days. During the month of July the same tradesman's receipts of fish averaged a ton a week. This is entirely owing to the steps adopted by the Fisheries Association for the preservation of the river in fence time, and the removal of fixed traps in the lower part of the river in the close months. Close time commenced on Friday, and we hope that the fishermen will see that it is their interest strictly to observe it."

Seeing these advantages of the Severn salmon fishery, the credit of which I believe is very much to be attributed to Mr. Boccius, and with the evidence that the Thames salmon fishery was formerly as good, it appears worthy of a trial to alter the weirs, and restock the river with young salmon.

I have had the pleasure and advantage of a conversation with Mr. Boccius, and he assures me if the weirs were altered, so as to allow the salmon to pass up and down the Thames freely, that he will undertake to restock that river with salmon. It will show great neglect in those who have the *real conservancy* of that river, or have the interests and comforts of the community at heart, if the attempt to carry out this desirable proposal be not adopted, to which he says he can show that the state of the river from Teddington downwards, and the traffic of the pool,

will not be so great obstacles as is generally supposed.

In Scotland salmon fishing begins on the first of February, and ends the thirteenth of September.

The salmon fishery of the river Thames is a subject of sufficient and proper importance to engage the attention of the Thames Angling Preservation Society, or the Court of Conservancy of the city of London, or even of the Houses of Parliament, to ascertain how far it may be possible to renew the breed of salmon in that river, and to have such alterations made in the weirs as would allow that fish to pass to and from the sea. Surely the engineers of the city of London could accomplish the object by the "*neat contrivance of staircases,*" as Mr. Cubitt designated them, or some other method, to allow salmon free ingress and egress to and from the fresh water. In order to restock the Thames with salmon, obtain a male and female fish at the proper season, and artificially breed young salmon as is practised now so extensively and successfully; let them be protected and fed for some time, and let that protection be continued until the young fish are able to provide for their own wants; at the same time let active measures be taken to destroy as much as possible the large pike and perch in the neighbourhood where the young brood are set at liberty; they will remain in the fresh water until,

strong enough to go to the sea; and as it is an undoubted fact that salmon bred in a river will return to the same stream, or some of its tributaries, in spite of very great obstacles, there is a probability that this species of fish may become once more a visitor to the Thames, though I fear the traffic on the river, and its filthy state, are against it; but Mr. Boccius says that would not be an unsurmountable difficulty, as the fish travel at night. The same plan might also be tried with a greater chance of success in the river Lea, provided free passage be afforded to them, as to reach this river the fish would not have to traverse the Pool: heavy penalties should be inflicted on any person fishing for them with nets, within three to five years. The Thames and Lea might also be well stocked with trout in like manner, fishermen being prevented from netting for them.

That the river Lea had its share of salmon, is an undoubted fact; the gentleman who set me up with tackle for bottom fishing, before-mentioned, caught one with a worm, at the White House fishery, about eighty years ago, which weighed ten pounds. A person angling in the Pool, at Bromley, for dace, with a gut line, and No. 9 hook, caught hold of a large fish, which bade fair to break his tackle; he, having no winch, allowed his rod to go into the water. Mr. Baker, then at the mill, lent him a

boat, in which, taking hold of his rod, he followed the fish round the pool, and after a considerable time, tired and killed a fine salmon of twelve pounds weight.

In 1805, whilst angling at the Horse and Groom fishery, Lea Bridge, I saw lying under the bank a large fish. I put a worm opposite to his mouth, and when he opened it, the worm went in, and I hooked him. He did not leave me long in doubt as to what he was. I had a solid trolling rod, forty yards of platted silk line, and a stout gut bottom. My line was soon nearly all run out. He was so strong that it was hazardous to check him, and he soon shewed me the bright side of a splendid salmon, by leaping entirely out of water several times on the opposite side of the river. I humoured his impetuous motions as much as I could, by dropping the point of my rod, which slackened the line sufficiently; by degrees I persuaded him to come a little nearer to me, and by playing him into shallow water, where, as a French gentleman said when he had hooked a large trout in the Lullingstone waters, "Vat a dust he did kick up." Finding him at length, as I thought, pretty quiet, I stepped one foot into the water to get hold of him, for I had neither landing net or hook, or any one within hail; but the moment he saw me, he darted off again, and if I had not had my rod upright

to let the spring of it bear upon him, at the same time giving him a little line, so as to defeat his sudden effort, I should have lost my prize. I played him round again to the same spot, when he began to swim unsteadily, and occasionally turned on his side. I fixed the spear of my rod in the ground, with my left hand on the rod and the line, in case he should make another rush, and with my right hand in the water, watched for the opening of his gills, inserted my finger, and leaving my rod standing, ran with my prize up into the meadow, where I killed him. He was the most game fish I had ever handled, and when I arrived at home, I found he weighed nine pounds and a quarter.

Mr. Shaw, of Dumfrieshire, in a communication to the "Edinburgh Journal," in January, 1836, gave some valuable information. He stated that by the artificial method, the ova of salmon were vivified in *ninety-four* days; and in the natural way, the vivification took place in *ninety* days.

In August, 1853, a large meeting took place in the County Buildings, Perth, of the Salmon Fishing Proprietors of the river Tay, and their representative, Mr. Thomas Ashworth, of Poynton, Cheshire, stated that it was easy to breed salmon artificially in rivers. He said that it was an established fact, that salmon and other fish may be propagated by millions at a small cost; and being protected against their natural

enemies by being in ponds for the first year of their existence, were more capable afterwards of taking care of themselves, and that he and his brother had at that time 20,000 young salmon, from two to three inches long, alive and thriving, artificially produced in ponds, which were daily and suitably fed with chopped meat. Mr. H. Ramsbottom, fishing-tackle maker, of Clitheroe, said, he had been very successful when engaged for himself, and his brother, who are proprietors of the Galway Salmon Fishery. Some of these little salmon were in the Dublin Exhibition for several weeks, and shewed their natural instinct to run up a stream by ascending a miniature *weir* with a proportionate salmon ladder in it, as before mentioned. The expense of breeding salmon he estimated at about one farthing each fish.

In the "Morning Post," 15th of August, 1854, it is stated that on a visit to the Storemont Fields pond, near Outerard, the young fish growing rapidly, consumed a liver a day for food. Breeding boxes were being dried and cleansed, to destroy the eggs of any insects. Breeding season to commence in November and December.

To Mr. Boccius I am indebted for the following:—"The Chinese were the first people who introduced artificial breeding of fish, by capturing brood fish just emerged from the egg, protecting them, and feeding

them, until in a fit condition for food. Herr Jacobi, a retired military officer, of Osnaburgh, about 1756 or 1758, I believe, was the first who attempted to take the spawn and milt from the live parent-fish, for the purpose of impregnation and production; and after some years of experience and attention, and proving his arrangements, introduced the subject to Count Goldstein, a talented naturalist, who published the account of Jacobi's experiments; but the subject died away."

Sir Humphrey Davey mentions that Jacobi bred trout artificially.—See "Salmonia," 3rd ed. p. 80.

Mr. Boccius says, that Sir Humphrey Davy, Sir Francis Chantry, Mr. Pepys, the improver of British steel, and some others, attempted this process at Mr. Hamlet's, on the Colne, near Uxbridge, but failed, not producing more than five per cent. of brood.

Mr. Blakey appears rather to depreciate this most useful art, as being merely a revival of a branch of science known to, and practised by, the Romans two thousand years ago, and that it is largely treated of by Columella and other ancient writers. This is not the fact; the Romans caught very young, probably brood fish, or like, as mentioned by Mr. Ashworth, the method practised by the Chinese, placed them in ponds, where they were fed most plentifully, and were taken out when in a state of perfection, to grace the

patrician tables, or were preserved in ponds to be angled for by Roman nobles, and even emperors.—See Oppian's "Halieuticks," Book i. v. 75 to 95. Columella was a philosopher of Cadiz, and was the author of a treatise on Agriculture; he flourished about A.D. 43.

I do not pretend to decide to whom we owe the revival or the invention of the method of breeding fish artificially in our country; but I think Mr. Boccius has certainly brought it to great perfection in the south, as many gentlemen have in the north, and on the continent, and they have very much simplified the process: his work on the subject, published by Van Voorst, of Paternoster Row, Mr. Ashworth's, and those of several other men of science, are very explanatory, and to which I must refer.

Samuel Gurney, Esq., Jun., a few years ago, gave me the egg of a trout, which had been thus artificially vivified in the river Wandle, upon the plan of Mr. Boccius. A sort of fine fin was attached to the egg, which was of a light reddish stone-colour, so far transparent, that the circulation of the blood in a pulsatory manner could be seen by a magnifying glass of very moderate power. The phial in which it was, being placed in a horizontal position, it moved from end to end with great velocity, but for want of a proper current of aërated water, it only lived a few days.

Mr. Ashworth says, that the Chinese, from the most distant ages, have collected and disposed of "fish seed," —fecundated ova, I presume, to those who wanted to stock, or restock their rivers or ponds, and that the Romans merely did the same; but it is, I think, easy to prove, that this was the extent of the knowledge of either the Chinese or Romans on this subject.

A beautiful plate of the progress of the egg of the salmon to maturity, is to be found in the Second Report on the Salmon Fisheries of the United Kingdom, plate 10; ordered by the House of Commons to be printed, 3rd June, 1825. Also a very explanatory one in Messrs. Ashworth's little work before mentioned.

The immense quantity of sticklebacks in the Wandle must prove very destructive to the spawn and young fry of trout; also the eels, which will take trout as large as gudgeons; therefore, unless the young trout are protected and fed till old enough to take care of themselves, they will be destroyed in great numbers, as soon as they are turned into the river. These pugnacious little fish, the stickleback, will attack fish twice their own size.

Stickleback, prickleback, or sharpling are taken in stagnant waters, and inlets of rivers, with a very small piece of red worm, with the prickles cut off: they are a very good bait for perch. (Taylor.) It preys on the spawn of fish, therefore is very inju-

rious in fish ponds. (Bowlker.) They will attack roach, dace, &c., twice their own size, and are most destructive of the spawn of fish. In the fens they are so numerous, that about once in eight years they are caught in cart-loads in the river Welland, and are used as manure; they fertilize the land extremely. They are also good food for poultry, who are very fond of them, as well as of sprats, and their effect is to increase both their fecundity and size. (Salter.)

"A man has been known to make four shillings per day by catching them and selling them at one half-penny a bushel for manure—96 bushels! They are so strong as to spring eighteen inches out of the water. The males are extremely quarrelsome, and will fight with each other most furiously; biting each other with their mouths, which are well furnished with teeth, and endeavour to pierce each other with their lateral spines; the conqueror pursues the conquered most vindictively, and the former changes his appearance, the lower jaw and belly becoming a deep crimson, and the back a fine green or cream colour, shewing animation and spirit, the latter losing both colour and spirit. Each choosing a different locality, a battle is the result of any infringement of another's territories."*

* I copied the above paragraph many years ago from a work "Tales about Animals, Fish, &c.;" and the statement about the

Le Societé d'Emulation of Vosges, France, have, since 1844, awarded medals to two fishermen of Labrasse, named Gètin and Réni, for having artificially hatched the eggs of trout; they have five to six millions of these fish, from one to three years old, in waters belonging to themselves; and they say that a trout of two years old weighs about four ounces and a half, and at three years, about nine ounces. Mr. Relph, who has been engaged in the salmon fishery above fifty years, states salmon grow under favourable circumstances about an ounce per week.—"Edinburgh Journal of Natural History," Dec. 1839, p. 40.

These two persons in France, have extended their methods of hatching the eggs of trout, to those of salmon, carp, pike, tench, and perch, whereby they have not only restocked many rivers, but lakes, and rivers in which, before, there were no fish, are now teeming with them.

The French Government have properly, and highly to their honour, set the example to other governments, by taking up this interesting subject, as a matter of great national importance, inasmuch as it will be a means of supplying the public through the medium of

"fights of the stickleback," in "Humphrey's River Garden," is nearly a copy verbatim of that former publication—a little more dressed out in point of language. Humphrey does not acknowledge whence he copied this.

the railways, with a large quantity of nutritious food. The Minister of Marine and Colonies has ordered experiments to be made, as to salt water, and some kinds of shell fish; and Commissioners have been appointed to examine the mouths of rivers, and the coasts from Havre to La Teste, Cherbourg, Granville, and in the environs of Trouville.

It is a very serious subject for consideration, or ought to be, with the government of this country, to promote as much as possible the breeding of fish, as a means of providing, in some measure, for the immense increasing population; the law should be put in force against every person taking fish with spawn, or milt in them, or of an illegal size; for every individual who captures them contrary to these regulations, is thoughtlessly an enemy to the community, by depriving it of what would contribute to the support and nutriment of many of his fellow-creatures.

The skegger, or scegger is the most beautiful of English fishes, and formerly abounded in the Thames. They had the shape and fins of the salmon; the back was a dull, dark, blue green, gradually going off to a bright silver, as it went down to the belly; it was marked with black and carmine-coloured spots, and a row of shaded blue marks, descending from the back to the belly, at intervals from the head to the tail, dark blue at the back, and by degrees less intense, as it descended to silver.

Hofland considered these a distinct species of fish, and gave them the name of salmon pink, brandling or parr. Mr. Graham, of Redgorton, entertains the opinion that the parr was not of the salmon species. As an instance, he adduces the river Almond as having no salmon, but great plenty of parr. Another author calls them samlets, and in the Mersey, in Cheshire, Dr. Brookes says the scegger is called a salmon-smelt, and that two of them whilst small, were put by a tradesman of Stockport into his fish-pond, and taken out in three years, when they were found to weigh five pounds each.* He also states, that they leave the Mersey in May or June, but does not say where they go to.

These fish have been extinct in the Thames ever since salmon ceased to frequent it; and I, therefore, think they were the young of that species of fish, abiding in the fresh water till strong enough to bear the sea water; for it is a well-authenticated fact, that young salmon will die if immersed in salt water until they have acquired sufficient strength, and then they go naturally to it with advantage to themselves.

About 1790, sceggers were caught very freely, and in great numbers, in the shallows at Laleham, near

* I must take leave to doubt this statement, being satisfied that sceggers are the young salmon, and would not live unless they had access to the sea.

Chertsey; a light fly-rod and line, a small artificial black, or dun gnat, with a gentle on the point of the hook, ensured good sport; they did not exceed six inches in length, and would take a small red worm. The last I have seen, and that was considered a great curiosity, was one I took with the last-mentioned bait, when angling from a punt for gudgeons, in August, 1825; and about that time salmon ceased to be known in the Thames.

In the "Times" of 15th July, 1854, it is stated, from the "Glasgow Mail," that this month a visit was made to the ponds, canals, and breeding boxes for salmon, on the river Tay, carrying on under the superintendence of Mr. Robert Buist, and they were found swarming with young salmon; they are from two to three inches long, will leap at flies, are fed on liver dust, have all the marks of parr, and if found in the river, would be so denominated.

In the "Supplement to Bell's Life in London," 23rd of July, 1854, there is a long article by "Ephemera,"* bearing very much on the subject of parr, whether they are, or are not a distinct species of fish, or the young fry of salmon. I have not the same opportunity of ascertaining this fact as the

* "Bell's Life in London," Nov. 22nd, 1857, p. 8, records the death of Edward Fitzgibbon, Esq., known as Ephemera, with an account of his life.

gentlemen whose names are mentioned by him; but, as I before observed, there are no salmon *now* in the Thames, and there are no sceggers or parr; and when, in my recollection, the former were numerous, there were plenty of the latter.

A very easy method of determining the question will be thus: if these little fish be a distinct species, they must have the organization necessary for the reproduction of their progeny. We know that the Thames is a river congenial to them; let some of its waters be stocked with two or three pairs of parr, well protected, and mark the result; if they be a separate species, they will breed their own species: but it is most probable it will be discovered that the parr cannot propagate their own kind. Another circumstance is very strongly conclusive; the sceggers of the Mersey leave that river in May or June, and so did the sceggers of the Thames, evidencing their migratory propensities, and those who did not do so, were probably some who had not acquired sufficient strength to battle with the ocean. The above statement from the "Glasgow Mail" appears decisive; for here are young fish absolutely bred from the ova of the salmon, yet having all the character of parr. A very extensive enquiry has been instituted by Dr. Knox on this subject in his excellent little work "Fish and Fishing in the Lone Glens of Scotland," published

1854, by Routledge, p. 80, to which I must refer any person curious on this subject. He admits that, if the course of the salmon be interrupted in any river, the parr disappears, and cites the Clyde: below the falls of Stone Byres there are plenty of parr, but above the falls not one is taken

I remember, when I was a boy, the Thames fishermen condemning the practice of persons taking sceggers, as tending to depreciate the salmon fishery in that river, as they all were of opinion at that time that these little fish were the young salmon which were not yet strong enough to bear the salt-water.

There is little doubt that the crucian carp is a hybrid, probably the spawn of the carp vivified by the milt of the bream, or *vice versa;* and the swarms of little fish apparently between the crucian carp and the bream, or some other mixed breed, which fill the Serpentine and many other large pieces of water, serve to prove, that although the hybrids of beasts do not produce any like themselves, yet the hybrids of fish do multiply most rapidly. Now this circumstance, I consider, might be turned to very good account, both as increasing the quantity of excellent and nourishing food, and affording amusement to the angler. And this opinion is confirmed by one of the most experienced fish breeders we have.

At the meeting of the Newcastle-upon-Tyne

Farmers' Club, held on 4th March, 1854, Mr. Orton, of Sunderland, read a paper on the "Physiology of Breeding." He stated, "that in the reproduction of the animal species there is no casual blending of the parts and qualities of the two parents, but that each parent contributes to the formation of certain structures, and to the development of certain qualities; and maintains, that the male parent chiefly determines the outward structures and locomotive powers of the offspring, *e. g.* the brain, nerves, organs of sense, bones, muscles, limbs, and skin; while the female parent chiefly determines the internal structures and the general size and quality, mainly furnishing the vital organs; *e. g.* the heart, lungs, glands, and digestive organs, and giving tone and character to the vital functions of growth, nutrition, and secretion."

Yet he considers that the male is not wholly without influence on the internal organs, and vital functions, or the female wholly without influence on the external organs, and locomotive powers of the offspring.

This he illustrates by the example of the male ass and the mare, and the horse and the she ass.

I am not about to follow this scientific gentleman into his very interesting reasoning, but feel confirmed thereby, and instructed in a theory I had

written, relative to the mixed breeding of some of our most valuable fish. It is a subject deserving serious consideration and experiment; for instance, say the ova of a trout vivified by the milt of a salmon, we suppose, upon the above hypothesis, should be outwardly formed like a salmon; but what its migratory propensities, or necessity for periodically visiting the salt water might be, it is impossible to form an opinion, without actual experiment; and so with the ova of a salmon vivified by the milt of a trout, we should expect the outward shape to resemble the trout species, but what disposition would be produced for constantly abiding in fresh water, we have to learn, or whether either of these fish would be troubled with those parasitical plagues as the salmon are, would be seen, if the theory proved to be a fact. It certainly would be a most desirable consummation to arrive at, if rivers could be stocked with fish of the salmon species, which had not the necessity to migrate to the sea. If the Thames particularly could be stocked with a fish of this description, without its migratory necessities, as thereby the filthy water of the river, from Battersea downwards, and the immense traffic of steam boats, would be of no importance, as to the fishery of our noble river. I sent a copy of this to Thomas Ashworth, Esq., and in his little work, pp. 18 and 19, are some observations on the subject.

Gentlemen who have the means at command, could easily ascertain the possibility of this suggestion being carried out, and could watch the effect upon the fish produced; supposing that the same law obtains in respect to fish as to hybrids of the terrence animals, and that hybrid fish have no power of producing a progeny (a question of easy solution), there would be little difficulty in annually stocking the Thames and other rivers with a valuable hybrid, thereby most materially benefitting the community in many parts of the world, as well as in these kingdoms.

A curious illustration of the physiology of breeding is to be found in the little fish called the ruff, or pope, which is no doubt a hybrid, for it is marked like a gudgeon, but has the form of the perch, is, like the latter, gregarious, a fish of prey, erects his dorsal fin as a defence, and is probably produced from the ova of a gudgeon vivified by the milt of a perch. Now this at first view may appear very extraordinary, seeing that the perch are constantly preying upon gudgeons, and cannot be supposed to form any friendly connexion, but it may be easily accounted for; thus, the latter with ova at maturity, in endeavouring to escape from the former, might, and most likely do, from the exertion, exude some of the ova, and the former from the same cause probably excrete

a portion of vivifying milt upon them, and this would so continually occur, as to give a reason for the great numbers of these fish in rivers where perch and gudgeon abound, if even hybrids have no powers of procreation. It is said by Dr. Brookes, who wrote above a hundred years ago, that the ruff spawns in April: much depends upon the state of the weather. This year, 1855, nearly the middle of May, I have a ruff, or pope, full of ova; there is, in my opinion, every reason to think this fish is a hybrid, and here is ample proof that it is capable of producing its own species, which, from the quantity of ova in the specimen now before me, must be very numerous. Birds produce hybrids, and those hybrids produce progeny. At Syfran, on the rivers Krymsa and Syfranka, they breed the Astrachan swan goose; the bird intermixes with the common goose, and its progeny will couple with each other. The pure bastards partake of the nature of the swan-goose, and the common goose as to size, shape, and colour; and mixing further with common geese, the young are of a blackish hue, their bills are red and bent, and have sometimes a little protuberance at the upper end.—Vide "Travels into Siberia and Tartary," by Dr. Pallas.

There can be little, if any, doubt, that hybrids amongst fish are very common, and that these hybrids breed. In the Serpentine and other large pieces of

water there are bream and pure roach, and within these few years there have appeared thousands of fish which partake of the characters of each of those pure species, and it is the same with other large waters with which I am acquainted. I have been informed, lately, that a person was seen to turn loose two or three small jack into the Serpentine, so probably some years hence another monster pike may be taken there, as plenty of gudgeons and myriads of these hybrids will serve him for food.

Now as the above, upon the authority of Dr. Pallas, proves that hybrid birds, which have sexual contact do breed amongst themselves, or with other species of fowls, there can be no doubt that fishes, which can be bred without sexual contact of the parents (as in artificial breeding), may and do produce hybrids, and that those hybrids produce progeny like themselves. Plants and flowers are, many of them, a mixture of two distinct species; amongst many curious specimens are to be found the plant whose flower or seed is a perfect resemblance of a small snail, and another producing a crop of caterpillars. Do we not cross the breed of dogs? and those cross breeds have progeny? To revert again to aqueous animals, look at Willoughby's folio Latin work on fishes; the varieties in the numerous plates, prove there are an immense number of hybrid fishes, and the recent work on apodal fish demonstrates the same fact.

Persons who have not thought upon the subject, or whose education has not comprised any knowledge of comparative anatomy, express sometimes doubts whether fishes have the sense of hearing. Without entering into a prolix account of the anatomy of the organ of hearing in fish, I shall proceed to give such concise observations on this interesting portion of the animal economy, which has occupied the attention of the most celebrated anatomists of the continent, and some in our own country. I have not had many opportunities of examining the organs of hearing, in any great variety of this class of created beings, neither can I in this little work enter into the extensive field of comparative anatomy. I must, therefore, refer those persons desirous of further investigation to the works mentioned by BRECHET, or, if they have time and ingenuity sufficient, to investigate the subject themselves.

The work just alluded to is, "Anatomical and Physiological Researches, as to the Organ of Hearing in Fish," by Gilbert Breschet, Professor of the Faculty of Medicine of Paris, Member of the French Institute, &c., &c.; 4to., with 17 Anatomical Plates. Paris: 1838. This work is in the French language: some of the notes are in English. Amongst other works M. Breschet refers to, are those of E. H. Waber; Leipsic, 1820. H. M. Ducrotay de Blain-

ville, 1822. Mons. Le Baron G. Cuvier et M. Valenciennes, 1828. Professors Otto and Heusinger, 1826. Dissertations on the Organ of Hearing in Man, Reptiles, and Fish; Geoffroi. Amsterdam, 1778. The Structure and Physiology of Fishes compared with those of Man, &c.; Monro. Edinburgh, 1785. Observations on Animal Economy; John Hunter. London, 1792. Many of these, with Mons. Breschet's well-written work, I have.

Breschet, in quoting from Monro, p. 48, would lead us to think that Monro asserted *all large* fish had an external auditory passage, whereas that celebrated anatomist was only there alluding to the skate, which genera have two small holes, or external auditory passages, terminating in a comparatively large sac, containing a white, opaque, and viscid matter, which must be of an alkaline character, for it effervesces violently if an acid be introduced to it. The whale species have also two external auditory passages, but they are only like the skate in point of size externally, namely, sufficient to admit the head of a small pin. In the whale genus, the bottom of this passage s closed by a membrana tympani, membrane of the drum, vulgo drum of the ear, to the interior of which membrane are attached a chain of small bones, and other organized parts as in terrestrial animals.

A work on "*Diseases of the Ear*," consisting of

above 644 pages, filled with *anonymous* cases, has been recently published by John Nottingham, of Liverpool, Licentiate of the Royal College of Physicians!! and Fellow of the Royal College of Surgeons, England!! as appears by the Medical Directory, though not added to his name in the above publication.

In his preliminary remarks is the following:—"In the human being, as well as in the higher vertebrata, the organ of hearing has three important parts. 1. An external ear and tube, to receive and transmit sound. 2. A middle ear, or drum, (communicating with the throat) to modify sound, and carry it onwards to, 3, the internal, or true ear, or labyrinth, which receives the expansion of the auditory nerve, through the medium of which it is connected with the brain. This part of the organ is essential to hearing; the other two parts to the perfection of hearing, as enjoyed by the higher animals.

"Of the parts above mentioned, fishes possess only the first: reptiles and birds, the first and second; terrestrial mammalia, the first, second, and third."

If common language is to be understood, the above assertion is, that fish have ONLY *an external ear and tube, to receive and transmit sound.* Now, with the exceptions I have just mentioned, fish possess *no external ear or tube to transmit sound,* but fish DO POSSESS

the other *organization* of the *sense of hearing, including nerves.* It being known to several, that I had seen the above book, I cannot stultify myself by allowing such ignorance of comparative anatomy as to fish, to go forth to the world, without notice. And from what I know of the subject as to birds, the same animadversion would be properly applied.

Monro says, it was disputed during two thousand years, and until the time of Goffroi, or Geoffrey, in 1753, whether fish had any sense of hearing. In this assertion Monro was labouring under very great error; for when Oppian wrote, about 1559 years before Geoffrey, it is evident, by reference to his Halieuticks, the sense of hearing in fish was not then a matter of *question* or *doubt,* but a fact *established so completely,* as to require no confirmatory observation.

Some fish have a passage outwardly analogous to the auditory passage of terrestrial animals. Of these are the whale, the porpus, and skate, the anatomy of which are delineated by Monro, who says that the whale genus can close the small outward orifice when they descend under water. Heusinger states that he has discovered openings at the summit of the skull, closed by membranes. G. Cuvier has indicated their situation at the base of the skull, and that they are closed by membraneous leaves.

The internal auditory apparatus in fish, resembles

in many respects that of animals which inhabit the surface of the earth; but the organic formation of the different species of fish varies materially. Their nerves are easily traced, and in some, the division of the auditory nerves follow a similar arrangement as in man, and probably with the same wise purpose; the one division being that of motion chiefly, the other that of sensation. Take, for instance, the carp; the bones, or ossicula representing, or in place of those of the ear of man, are lodged in a cavity divided into two parts by a partition, where they float in a semi-gelatinous clear fluid; and in each of these cavities is found two ramifications of the auditory nerves, which are expanded over the respective bones, two in number, on each side. There are also three semi-circular canals on each side; these are filled with a semi-gelatinous fluid, and in them very minute fibres of the sensitive portion of the auditory nerve float, as in the human ear; and the base, or sensorium of those nerves, is in the brain. Other fish have similar formation of the organ of hearing, more or less perfect, apportioned, no doubt, by the All-wise Creator, to their habits, modes of life, and nature of their food. The bones belonging to the organ of hearing in fish, like the bones of their bodies, are more solid, and larger in those inhabiting the sea, than those living in fresh water; and the ossicula, of which I have a little col-

lection, vary extremely in their shape, and the disposition of their grooved surfaces, in which they receive the auditory nerves. But in none of these ossicula can be found a trace of phosphate of lime, or of carbonate of magnesia, they being composed of animal matter somewhat about one-fourth, and carbonate of lime three-fourths. The gelatinous fluids mentioned, are, no doubt, renewed from the mucous membranes lining the several cavities, as in man.

It will now be necessary to give a short account of the organ of hearing in man, whereby the comparative anatomical structure and physiological functions can be properly estimated. In the human race, the undulations of air occasioned through it being set in motion by substances being struck against each other,—ringing of bells, explosion of fire-arms, music, the human voice, or other disturbances of the air, causing it to be set in motion, these undulatory waves enter the auditory passage, and occasion the membrana tympani (vulgo, the drum of the ear) to vibrate; the ossicula, or chain of bones within this membrane, one of which is attached to the middle of this membrana tympani, on its inside, are consequently set in motion, and that motion is communicated to the delicate fibres of the soft or sensitive portion of the auditory nerve, which floats in a fluid, which motion is continued and conveyed to the base or seat of the auditory nerves in the

brain, with a velocity that annihilates time. In man, the soft portion of the auditory nerve floats, as I before said, in a liquid, and its fibres are diffused in the several parts of the labyrinth, consisting of the cochlea, vestibule, and semi-circular canals. In mankind it is necessary, nay, indispensable that the *very numerous* small glands which line the auditory passage half-way down, should exude the usual healthy excretions, the fluid portion of which vapourises, and the heavy vapour or gas thus formed, descends downwards by its own gravity, lubricates the lower part of the auditory passage, and the membrana tympani, keeping them in a proper state of elasticity to receive, and transmit the slightest vibration of air occasioned even by the sound of the voice. When the auditory passage becomes dry, either from congestion of the cerumenous glands, through exposure of the body, or head, to sudden changes of temperature, improper modes of living, or vicious habits, diminution of the sense of hearing, in a greater or less degree, comes on, and too many general practitioners of good ability in other cases, as well as most of the regular professors of aural surgery, have blundered on for ages, torturing and ruining the health of the poor creatures who are so unfortunate as to consult them, with blisters, setons, issues, caustic, acoustic drops, mercurials in ointments, or as internal medicine, and all sorts of

devilries, not only perfectly *useless*, but *highly injurious*, and *too often fatal*.

Two new aspirants for fame, as aural surgeons, have appeared; and to attain that object, have made up large books on the ear. I have looked them over, and find nothing new to afford the slightest satisfaction for the trouble. But I do find useful matters, of which I was the inventor, and I published more than forty years ago, now appropriated without stating from whence the parties borrowed the idea. The first of these book-manufacturers assumes a dictatorial, self-sufficient, tone in his compilation; the other is all silky, prolix plausibility, endeavouring to prove that although the whole mechanism of an ear may be destroyed, and even speech be lost, the dropping into the ears of a solution of sulphate of copper, and rubbing nitrate of silver (lunar caustic) on the protuberant bone behind the ears, restored hearing and speech? Credulous indeed must any person be to believe such a statement! The same author, in a case wherein the membrane, vulgarly called the drum, was destroyed, advised a very small wire shirt button to be introduced, with a pin through it to serve as a stalk or handle! Surely the author cannot be serious, but has written this to ridicule Mr. Toynbee's artificial membrana tympani. The methods of treatment of both these authors are such as I have stigmatized.

Having thus concisely, and I trust clearly, explained the anatomy and physiology of the sense of hearing in man, and an epitome of that of fishes, it will be obvious that as vibration of the membrana tympani in the former, carried on by the ossicula to the auditory nerves, and thence to the brain, produces the sense we denominate hearing; so, if the ossicula in fish are caused to vibrate, a similar communication will be made to the brain of fishes. The question to be now solved is, how that vibration is effected; and to elucidate this, we must investigate the nature of the two different elements in which terrestrial animals and fish exist. John Hunter, in his "Economy of Animals," says, that before the time of Geoffroi the different mediums in which land and water animals existed were not considered: this is much about as correct as that Geoffroi was the *first* to assert that fish had the sense of hearing. Why, the commencement of the first book of Oppian shews how erroneous and unfounded these assertions are.

Air which supports and nourishes terrestrial animals is fatal to fish, (some species sooner than others,) if they remain out of the water during a short time; and yet, like man, and other animals of that class, they cannot live unless they imbibe oxygen; only there is this difference, man inhales it from the atmosphere, whilst fish extract oxygen from the water

by aid of the gills (the lungs and medium of the circulation of the blood in aqueous animals). When the air is set in motion by the sounds I have mentioned, or any other sound, the result is, that from the point where the noise or sound is created, a succession of circular waves of air expand on every side in the form of a globe; if these waves meet with any obstruction to their expansion, and the obstruction be of a concave character, the waves of air are collected into a focus, and are reflected back, forming what is called an echo; and if there be several of these concave obstructing substances, there may be several echoes one after another, louder or fainter, and more or less immediate, according to their several distances.

A very plain exemplification of this may be shown by throwing a stone, or any substance, into a pool of still water; circular undulations, or waves, will immediately diverge from the spot; these waves will be higher, but smaller in circumference, immediately around the place where the substance struck the water, and as they recede from the centre they become less in height, and larger in circumference, until they are no longer to be seen. Now these undulations extend below the surface, forming a half-sphere; and like as waves or undulations of air affect the auditory organs of man, and cause vibration which is communicated to the brain, through the auditory nerves, so

the vibration of water, a tangible substance, through the thin structure and want of solidity of the cranium in fishes, agitates their ossicula, and that sensation is communicated to the sensorium, or brain of the fish, through the auditory nerves, and instinct or natural intelligence gives them the power of knowing whether the agitation of the element in which they exist, is indicative of danger, or the approach of food; any explosion or other cause which produces trembling, or shaking of the banks of a pond or river, occasions agitation of the water, and the fish hear, or rather feel it, for in point of fact what is denominated hearing is feeling; we feel the vibration upon the membrana tympani, which is conveyed thence through the ossicula and nerves to the brain; but the brain requires education. A young child feels the vibration caused by sound which I speak of, but does not understand what it indicates, until by degrees it learns that certain vibrations given to its brain, by the agitation of the air occasioned by sounds, mean certain things. I have had great opportunity of forming a judgment on this subject; for having given to children whose membrane or nerves had never vibrated, in consequence of *any* sound which could be made, the power of being affected by the slightest noise, I took one into my family who had become an orphan, and educated her; but the difficulty of inducing her to

recollect that certain sounds denoted certain objects, or rather that certain vibrations of what is called the auditory apparatus, represented certain ideas and things, was beyond conception.

Fish of prey are driven away by disturbance of the water, such as is caused by throwing in ground bait; but when the roach, dace, &c., are thereby gathered together, after a time a pike or perch will be attracted to the spot by the number of small fish collected round the ground-bait, some of which will become his prey, and the others frightened away by the voracious enemy of their species; the same occurs in gudgeon fishing; the only remedy for the angler is, either to remove to another place, or, with appropriate bait and tackle, endeavour to catch the intruder.

The effect of the vibration of the water on the brain of fishes, is no doubt different upon various species; that vibration which warns some of them of the approach of danger, teaches others instinctively to seek for food the moment ground-bait, worms, or paste is thrown into the water; this is particularly seen in roach, dace, and chub; if a quiet place in the Thames be selected, when the water is clear, by throwing in some of the above-mentioned articles, very shortly after there will appear a great number of small fish near the surface, larger ones lower down, and the largest at the bottom. I have observed, that if you

put the ground-bait in very gently, so many fish will not be attracted to the spot, as soon as if you throw it in more forcibly, because the agitation of the water being greater, it is felt at a greater distance; if a handful of gravel be thrown into a clear part of a river, you will see in a few minutes a number of fish sailing about as if looking out for food. Gudgeons are attracted in shoals by raking the bed of the river, and there can be little doubt but the disturbance thus given to the water and the gravel, causes them to be attracted to the spot, through the vibration occasioned to their ossicula and nerves, and instinct teaches them to search for worms, insects, &c. If you approach the bank of a river, roughly, the fish will rapidly retreat to a distance; this is from the tremulous motion given to the earth being communicated to the water.

The following fact will prove the truth of this assertion:—One day I was very successful in taking trout at the head of a piece of water, through which a branch of the river Test had been artificially directed, and was walking round a plantation to go to the lower part of the same water. In order to nourish these young trees, several channels had been cut, so as to send, occasionally, a portion from the upper part of the stream to their roots, by means of a sluice; the water ran into the lower part of this species of lake

through a cut about a foot wide, which had a depth of water at the lower end of about a foot, and shallowing to two inches at the distance of thirty feet from its lower point of exit. As I approached this spot I heard a noise up the cut—I had been using my landing net; thinking the noise might be caused by a fish which had probably gone up the little channel after minnows, I placed my net at the end of the cut, jumped heavily upon the ground, and instantly a splendid trout rushed into my net, weighing three pounds. Now this must have been through the tremulous motion I gave to the earth being communicated to the water, and thence to the organ of sensation in the fish, and instinct apprised him that he was in danger in his then locality, which he endeavoured to avoid by flying for safety to the deep water. This circumstance, and his explanation, appears to me quite conclusive, that this fish must possess not only some sense analogous to that of hearing, but also a degree of intelligence to seek the outlet into deep water where he must know he would be safe. He would not have quitted the position he had taken from any other cause than that of hearing, because it was impossible he could see me.

Mr. John Hunter caused a gun to be fired near some water wherein there were a number of fish

sporting near the surface; he had the gun fired behind some trees, so as, he says, to prevent the flash from being seen; this precaution was not sufficient to prevent the light and smoke being diffused throughout the adjacent atmosphere, and the very perfect vision of fish would discover it. Now as it is a well-known fact, that a bird flying a considerable height above the water, will cause fish basking on the surface to descend instantly, so the fish in Hunter's experiment descended through what they saw, and not because they heard. An opinion has been very absurdly advanced, that fish do not hear, because it is asserted they *do not* appear sensible of the explosion of fire-arms; this is an opinion based on no better foundation than Hunter's experiment. The organs of sensation in fishes analogous to what we denominate hearing in ourselves, can only be affected by the vibration of the element in which they exist.

The tales told about fish coming to be fed at the ringing of a bell, are mere fabulous inventions; that fish as well as terrestrial animals will come at regular periods to any particular spot to be fed, is a fact of constant observation and proof; but that fish will come to that spot on hearing the ringing of a bell, is wholly untrue, because they cannot have their auditory apparatus acted upon except by the agency of the vibration or undulation of the water.

Music heard by human ears across a considerable expanse of water, sounds beautifully soft and melodious; the reason is, that the vibrations of air produced by musical sounds not being able to penetrate the water, are reflected back into the air, and uniting with the direct undulatory vibrations, tempers them into a kind of echo in the air, rendering the sounds far more harmonious and sweet than they would have been without this reflection. Fishes are not sensible of music, for this very obvious reason, it does not penetrate and agitate the water, therefore can make no impression on the organs of sense in aqueous animals.

Zoophites, a most numerous tribe, are living substances, which partake of the nature of both animal and vegetable life, forming the link which unites the vegetable kingdom, to the immense world of animated beings, fully illustrates my position as to the undulation of the water as affecting animals that live in it, and proves how extremely susceptible they are of the slightest motions in their native element; for introduce your hand, however gently and cautiously you may into water in which these flower-like substances are found, they instantly close, and shrink into the hollow of the rock, reappearing in all their beauty, very slowly and cautiously, after the water is again quiet.

Fish have certainly the senses of smell and taste; the first *very* perfect.* Honey has a sweet taste, and also a pleasant smell; and I have mentioned how almost indispensable it is to mix this production in paste for successful carp fishing, also for roach. Strong cheese in paste is very attractive to chub. About the latter end of August or beginning of September, if the weather have continued for some previous time fair, the water of the river Thames, from about Teddington upwards, is so clear, that fish of a moderate size can be seen distinctly eight feet or more below the surface. I was lying down, looking from a high piece of planking and piling into a deep hole, called Halliday's, or more properly Alliday's hole, near to Thames Lock, and seeing a good-sized perch, about eight feet down, swimming about as if in search of prey, I dropped my bait to him, a worm, which had been on the hook some time; he approached, rubbed his nose against it, but would not do anything more. I drew up my line very gently, put on a fresh worm, which smelt strong and exuded a rich yellow liquid; he approached, touched it with his nose, and swallowed the bait in a moment, and I landed him, weighing

* The Olfactory Nerves. B. Harwood, Professor of Anatomy at the University of Cambridge, published a little work in 1796, on Comparative Anatomy, with plates, amongst which are some explanatory of these nerves in fish.

above a pound. Now the question is, whether this was taste, or smell, or the two senses combined.

Blumenbach says, fish of prey swallow that prey whole. With every respect for that talented anatomist, I must take leave to state that he is incorrect; if they take a small fish, such as a minnow, they seize it by the middle of its body, in turning it to take it down head-foremost; they in a manner masticate it; but if the prey be a large gudgeon, or a large roach, or dace, it is much mutilated, and only partially swallowed—that is, the head and shoulders; and the pike, perch, or trout's jaws are constantly in motion, triturating, and masticating the head and shoulders of the fish so preyed upon, to a pulp, and following up the same process with the remainder, till it all passes into the stomach.

In the manner of catching trout by bringing the worm opposite to the mouth of the fish whilst he is lying in a torpid state, as if asleep (as mentioned a little further on), the moment a worm enters the jaws, with the little influx of water, the mouth begins to move, apparently in the act of rapid and self-gratifying mastication. This fact, proves that fish have the organ or sense of taste; and that in search of truth, dependence is better placed on practical knowledge, than on theoretical assumption.

The most clear river, about the same time of the

year, and as above, is the Oxley Mill, or Abbey river, near Chertsey; it comes out of the Thames, about Penton Hook, near Staines; most probably a cut made artificially by the monks of Chertsey Abbey, to give motive power to their mill, a little above Chertsey bridge, where this river discharges itself again into the Thames; a small stream arising at or near Egham joins it. There are few rivers better stocked with pike, perch, roach, dace, and chub, than this; the soil it runs over, is partly a sandy loam. During the heavy floods of winter, very deep holes, alternating with shallows, have been formed, and from the light colour of the bottom, the fish can be clearly seen in them in great depths during bright days. I have seen a dozen or more of perch swimming together, not one less than two to three pounds; and I saw one about four pounds, seize a roach near or quite six ounces, which the perch pressed against the bank, endeavouring to turn the former, so as to take him head foremost; when the perch had accomplished that object, he sailed away into deep water, with part of the tail end of the roach projecting from his mouth; —a fact which proves what I have just before observed as to fish of prey.

This river is encumbered with wood, but fine chub may be taken by dibbing with a large blue-bottle, a moth, or, during the season, a cockchafer.

Having now considered to what extent, according to our finite abilities, the senses of hearing, tasting, and smelling, are conferred on fish, it is proper to notice their sense of sight. There can be no doubt, but they have that sense in great perfection, but some species have it more acutely than others, according to their habits and necessities. As an instance, observe salmon, how they will leap at a fly, or large moth, hovering over the stream, in the evening of a summer's day, and secure it before the insect can touch the water. Trout also, will do the same in a less degree: this evinces the great accuracy of their sight. An illustration of what was the condition of a trout deprived of that sense, must be introduced by the following little narrative. Many years ago, I, frequently during the trout season, accompanied a friend to the river Wandle. I had access to some of the preserved waters, but he had not, consequently I angled only in the free waters when he was with me. On one occasion, of a beautiful prospective day for trout fishing, when we had reached Mitcham Common, the clouds and little breeze disappeared, and the sun shone in complete effulgence, so that it seemed useless to attempt to throw a fly with any expectation of success. On reaching the river we could see plenty of trout lying basking, a little below the surface, and apparently

asleep. I directed my fly so repeatedly before one, that at last it awakened him, and he was soon in my bag. I tried the same plan with several others without success, and determined not to go home without a companion for the one I had caught, if I could prevent it. I scratched up a worm with the spear of my rod from the bank, shifted my fly for a plain appropriate hook, which I baited, shortened my line, and gently dropping my bait into the stream, about a yard before the largest trout, guided it down to his mouth; he did not notice it; therefore, cautiously withdrawing the worm after it had passed him a yard or two, I tried it a second, and the third time I saw the worm disappear, and the trout's jaws began to move, as if he were masticating, when with a little turn of the wrist, I had him securely. I caught two brace more in the same manner, and could have taken as many as I pleased. My companion tried to do the same, but could not succeed. After that, whenever I went to the free waters, I always had a long bamboo rod, and a few worms, so if the weather proved unfavourable for fly angling, I could generally make sure of a brace or two, by this mode. I do not consider this fair fishing exactly, neither did I ever practise it in any but free waters, wherein all arts are considered fair. About the year 1839, whilst landing a trout which I had hooked in the river Test, Hampshire, I

observed a long, black fish, lying at the bottom. I shewed it to my friend to whom the water belonged, who had just joined me. He expressed a great wish to have this fish. I requested him to send his gardener to me with a worm or two: my friend brought them himself. Meantime, I had changed my tackle. I then baited with a worm, and, by the same method as I have just mentioned as having tried in the Wandle, in less than five minutes after, I landed the fish, a trout, quite black, and considerably longer than one I had previously caught in those waters, weighing full two pounds and three quarters; but this poor fish was so thin, that it weighed only one pound and three ounces. On examination, we found he had lost one of his eyes by some violence, and the sight of the other was completely gone, having become opaque, and looked as if there were a cataract in it. This unfortunate fish not being able to *see*, and feast upon the flies on the surface, whereby he would have become fat, and in good season,—for flies are absolutely necessary to the nourishment and perfection of trout, at the proper time of the year—was obliged to grovel at the bottom, and feed on such food there, as his *smell* and *taste* directed him to adopt.

I often thought of this unfortunate trout, and his miserable state of starvation, which would soon have caused his death, but could form no reasonable opinion

how he became deprived of sight, until reading the "Practical Angler," a very useful book, published by Simpkin and Marshall, 1842, I formed a solution of the question. It is there stated, p. 13, that an eel has been seen to dart against a trout, striking it so forcibly near the eye, with his lower jaw, which protrudes beyond the upper, that the trout was stunned, turned on its back, and floated insensible down the stream. In the river Test, there are eels of a very large size, and one of them probably had attacked this trout, and blinded him; now as the eel could not have eaten a fish of that size whilst alive, but would easily pick his bones after the trout was dead, it appears something like a kind of intellect on the part of the eel, thus apparently providing a future feast for himself, or some of his species.

It is amusing to sit in a punt, over a sand-bank, on a bright day, in a quiet part of the river Thames, where the water is shallow and clear, and pick out the gudgeons you wish to capture, by putting your bait close to their mouths, and to see how they will turn away from a bad or mutilated worm, but rapidly seize, and apparently masticate, a good one: this must be by either sight, smell, or taste.

Mr. Rennie is of opinion that fish have not the sense of sight in perfection; but this must be quite erroneous. Watch a trout stream, observe the fish, lying

floating, with their heads pointing up the stream, how they diverge a considerable distance to the right, or left, to examine every little object that floats near them, and ascertain whether it be fit for food; but only let a fly come within a yard, and see how the fish will dart forward, and seize it; this must be through the excellence of the trout's vision, for there is nothing in this instance to agitate the water, so as to produce any vibratory effect on the organ of hearing, neither can the fish be guided to its prey by the sense of smell, of an object at that distance.

Again, watch a chub basking in the sun. Let the shadow of a bird, at a considerable distance, only pass over the spot, and the fish descends instantly. If this be not acute sight, what induces that motion in chub?

Another exemplification of the acute power of vision, will be found in the following. Close to Thames Lock, there was a grove of trees which extended a short way up the bank of the navigation, amongst them were two or three cotton trees. When the pods containing the cotton burst, on coming to perfection, the flocks of cotton descended, probably half of them into the water, where there were a shoal of bleak awaiting their descent; one among their number took the flock of cotton in his mouth, pulled it under water, extracted the seed which was attached to the cotton and let it go, when the cotton

rapidly rose to the surface, by the buoyancy of the cotton, and the air it contained; the seed once extracted, no fish touched that flock of cotton again. Every one who has watched the motions of the trout as above-mentioned, or the bleak with the flocks of cotton, and their discrimination in never taking one that had had the seed extracted, and hundreds of persons have done so, have involuntarily observed, "*what excellent sight fish must have;*" and similar to this may be observed in the motions of chub, roach, and dace, at the top of the water, and many other fish at the bottom.

About four years ago I revisited the scenes of my childhood; alas, how changed! Vandalism had been at work, not only were these curious trees,* which used, in the season, to render the river and land around them a complete sheet of cotton wool, destroyed, but also the house on the estate with its beautiful painted staircase and ceilings, the splendid orange trees and pleasure grounds, once the abode of

* These cotton trees, as far as I remember, were more lofty than some large larch trees near them, their trunks were from twenty-seven to thirty-three inches in circumference, the leaves were of a lively yellowish green, small heart-shaped, thin and extremely smooth. From the report of Mr. Wm. Franklin, who wrote on Persia, cotton trees are very common all over that country; also another, a small tree, which yields a kind of silken down, used for quilting and stuffing pillows.

royalty, and of the *favourite* of a king, James the Second, serving him after as a refuge; and finally, by a marriage with the king's mistress, the seat of the Earls of Portmore—all, all completely annihilated, and not one brick left upon another to mark the site of its former regal splendour. The family and title of Portmore are also extinct.

The bleak is a small fish very like a large sprat in shape, scales, and colour; they are very numerous, and afford amusement in a summer evening, by whipping for them with a very light fly rod, seven or eight feet long, and a fine taper line about double the length of the rod, two or three small artificial ant-flies or gnats, each hook pointed with a small gentle; or fish with a very small light *self-balanced* float, about eight inches from the bait, of one small gentle. The flesh of this fish is sweet, nutritious, and pleasant; I once caught thirty dozen of them, had them marionated, and they were excellent.

These little fish breed within them a white worm; when they are thus afflicted, they cannot sink, but swim about mostly in circles, with their heads even with the surface of the water; they generally appear, if the weather be hot, in July, and are called by the watermen "mad bleak." I have often met with them in going by water in a wherry from Westminster to Wandsworth, and I believe they are found as

high up as Teddington—a blow with the flat of the scull kills them. I have taken this worm out of the fish alive frequently; some have been seven inches long, others from that length to ten inches, about three-tenths of an inch in width, coming to a blunt point at each end, and one-tenth of an inch, or more, thick in the middle, ribbed across. There is no doubt but these worms must destroy the fish eventually, but what becomes of the worm afterwards no one can tell. As the fish thus affected are only found where the Thames is turbid, I imagine these worms are generated through the foul state of the water.*

In the first volume of the Mirror, published in 1826, article "Medical Quackery," it is stated that these worms are used by quack worm-doctors, to exhibit in their windows, as having been expelled from the human body by the efficacy of the empiric's medicine; and of a verity the worms exhibited by these impostors are so marvellously like those which torment the poor bleak, that any person comparing them together would pronounce them to be the same.

The scales of the bleak formerly furnished the means of making artificial pearls; it is estimated that one pound of scales cost the lives of 4,000 fish, that a pound of scales only produced four ounces of

* I do not think any naturalist has noticed this disease of the bleak.

pearly precipitate, and at one factory in France ten thousand pearls were issued per week. Now the Argentine or Tiber pearl fish, very like a smelt, but not having its fragrant smell, supplies the material for making these ornaments from their swimming bladders, which are taken out and plunged into a bottle of spirits of wine; when wanted, they are macerated in a solution of isinglass, till all the pearly particles are detached; this is put into glass beads of the size required, with a hole at each end, and equally diffused, the holes being kept open, they are then filled with hot wax, and, when cold, strung. The largest bleak of which I can find any account was taken at Cheshunt, 16th September, 1832; it was seven and a-half inches long, as is recorded by Mr. Baddeley, of Compton Street, Goswell Street.

Leuwenhoek satisfied himself that the age of fish could be discovered by the scales; an annual fresh lamina forms over the first scale, larger in every way, corresponding with the growth of the fish, therefore by separating these laminæ, and the aid of a good microscope, the age of the fish may be ascertained pretty correctly, for fish do not shed their scales; those of the eel form a very beautiful subject for a microscope having a high power. Monro states that "the surface of the bodies of fishes, especially those that live in the sea, is defended by a quantity of

viscid slime, which is supplied by ducts placed upon their sides; in some fish this is more abundant than in others; some have these ducts placed pretty regularly over the surface; the mucus exuding from these ducts is so extremely viscid that it is difficult to squeeze it out." Now as the scales of fish must have some origin, is it not reasonable to think that this mucus, after the more fluid portions have lubricated the surface, the remainder may solidify and form continually the increasing number of laminæ?

The anatomical formation of the eye in fish is a most extraordinary proof of the exquisite and wonderful adaptation of the parts of the animal to the medium in which it is destined to exist, hence the crystalline lens is quite round, which is not the case with terrestrial beings; but from the conformation of the whole apparatus, and the element in which they exist, fishes cannot see objects far distant, though some species, such as fish of prey, have greater powers of vision than others. As fish do not require any aqueous secretion to keep the surface of the eye moist, they have no lachrymal gland. Fish generally have no eyelids, some have a compensation for it, in a species of fixed covering at each angle, very evident in salmon and mackerel; the eel too, to protect his eyes in working his way through mud, has a transparent case placed a little way before the eyes, of

sufficient strength to protect them from injury, but when they grow large, eels very frequently are blind.

In Sir Charles Bell's "Anatomy," 7th edition vol. ii., p. 447, it is stated, "fishes have the (optic) nerve arising from one side of the brain passing to the eye of the other side; they cross, but they do not unite."

"The Solitary Hunter," by John Palliser, Esq., gives some account of the mammoth caves of Kentucky Speaking of the subterranean rivers of those caves, "We caught some fish with a landing net in these rivers, and found them, by a wonderful dispensation of nature, without eyes, or any organs adapted to the reception of light."

This excited my curiosity, and unable to obtain from very talented naturalists and zoologists any information on the subject, one of these gentlemen of the very first class, answered, "he had no recollection of any fishes which have no eyes, or their equivalents; but I am by no means incredulous as to the fact, seeing that we have so many animals, even mammals, similarly situated." As I do not allow myself to be *easily* defeated, I have written to the proprietor of these caves in Kentucky, and hope to have a specimen of these curious fish. I mentioned the subject to the same friend who favoured me with the particulars about the first paper mill, and he having great opportunity of research, has still further favoured me with most

extensive information on the subject, which I shall endeavour to condense for the information of the world.

In Silliman's "American Journal of Science," vol. xlv., 1843, is a full and most minute account of the anatomical structure of these fish, but which would be too extensive to insert here. This investigation was made by Dr. Jeffries Wyman, member of the Boston Society of Natural History. The specimen he dissected was $4\frac{1}{10}$ inches long, it had a large quantity of teeth, so that it must be a fish of prey; the nostrils were particularly well defined, therefore the sense of smelling is probably acute, although he does not make any remark as to the olfactory nerves. The inferior optic lobes very small, not larger than a pin's head, *no optic nerve was found*. This gentleman says, "This fish, inhabiting a dark cavern, is reduced, as regards the organs of vision, to a much more imperfect state than the *Proteus anguinus* inhabiting the subterranean caverns of Illyria, or the common mole, in both of which eyes exist, although of a microscopic size."

In "Fraser's Magazine," vol. xlii., 1850, some observations are inserted from the pen of an officer of the Royal Artillery, who visited these caves of Kentucky: he states that these fish are wholly without eyes—not the smallest trace of that organ can be detected externally; the rudiment of an optic nerve is its sole internal representative. They are perfectly

white or colourless, and when the water is clear are easily detected. He says he had not the good fortune to see any (probably because, as it appears, there was a flood at the time he was there). He also says that an eyeless crawfish, exactly like the common brook crawfish, only perfectly white, is found in these subterraneous waters.

In "Silliman's American Journal of Science," vol. xvii., 1854, Dr. Wyman gives, at great length, further particulars of these fish, to which he has added observations on their organs of hearing, of which I will endeavour to give the substance. He states that Telkampf, in company with J. Muller, of Berlin, for the first time (as it was asserted), detected rudimentary eyes, "New York Journal of Medicine," 1845, vol. v. p. 84. Also that Dr. Dekay (see "Fauna of New York") thought that he had detected eyes, covered by the skin; but as the substance of what he considered were eyes, had not any of the necessary separate parts to form that organ, and no nerve was connected with it, there could be no reason to think it was the organ of sight. Dr. John C. Dalton, jun., also thought he had detected eyes, but was, it is believed, mistaken. Professor Owen has described the organ as a simple eye speck, "as in the leech, consisting of a minute tegumentary follicle, coated by dark pigment, which receives the end of a cerebral

nerve," ("Lectures on Comparative Anatomy," vol. ii. p. 202; see also his figure, p. 175.) But the reasoning of Dr. Wyman inclines one to the belief that Professor Owen's statement is erroneous. Dekay has placed these fish amongst the *Siluridæ*; but Dr. Wyman, who has had great opportunities of judging from dissections and close examination of its osteology and whole anatomical structure, as compared with specimens of *Amblyopsis spelæus* which he also dissected, says that it belongs to the latter genus.

But if Providence has been pleased to withhold from these fishes the sense of sight, it is probably compensated by excellence of the sense of smelling and of hearing; for as before observed, the olfactory organs are particularly well defined, and the auditory apparatus much larger than in any other fish of the same size, and the otolite of the vestibule (one of the bones described, when describing the organ of hearing) is very large in proportion to the size of the fish: and it is asserted that the blind fish are acutely sensible of sounds, as well as to undulations produced by other causes in the water.

As plants which in the light grow up a dark green colour, but if allowed to do the same in a dark place

* Because the voice, or any noise made in a cave, produces vibration of the substance of which the cavity is formed, and that vibration is communicated to the water.

are white, may not the fact of these being white be accounted for upon the same principle?

A gentleman, a patient of mine, who had travelled very much, informed me there was a mountain about forty miles from Vienna, named the Semmering, from which a considerable way up there issues a stream of water, and the inhabitants often catch fish of the trout species, by letting the water run through a net; I should be gratified by an opportunity of examining one of these fish.

On bringing a trout to land which you have hooked with a fly in the Test, suddenly he will be surrounded by six to eight, or a dozen of the same species, who rush against him. At first I was inclined to think this was a type of the conduct of too many of the human race, who, when a man is unfortunate, or going down in the world, assist in crushing him; but after a little reflection, I am inclined to believe that it was still typical of mankind, for other trout seeing the fly protruding from the mouth of the one hooked, endeavour to wrest his prize from him; and so covetous men, seeing their neighbour prosper by a speculation, will use every endeavour to deprive him of the advantage, his talents or industry have procured for him. This may be, however, practically illustrated in a poultry-yard, where a fowl or duck, having obtained a large piece of food, more than he can at once

swallow, will be pursued by his companions eager to share the spoil, and tear it from his beak.* The voracity of the pike is well known. When a youth, I was angling with a live bait, a gudgeon; I hooked a small jack, about three quarters of a pound; he was hooked by rather a large hook, by the upper lip, and as I was drawing him to land, a pike of about seven pounds dashed at him, and was hooked by the hook and gudgeon which protruded from the lip of the small one, so by a quick use of a landing-net I had two fish. In this case I think the large fish was attracted by the gudgeon hanging from the mouth of the small one; this confirms my opinion that the trout are attracted in like manner by the fly hanging from the hooked trout.

In the "Reading Mercury," an account was inserted, that a lad aged fifteen, named Longhurst, went into Inglemere pond, near Ascot Heath, to bathe; when he had walked in to the depth of about four feet, a huge fish, supposed to be a pike, suddenly rose to the surface and seized the boy's arm; however, finding resistance, he abandoned it, but still followed and caught hold of the other hand, which he bit very

* Oppian, book iii., verse 440 to 450, attributes this action of the fish to friendship, and commiseration on the part of the fish who are at liberty toward one in trouble. But I think my explanation is the most correct.

severely; the lad clenching the hand which had been first bitten, struck the monster a heavy blow on the head, when the fish swam away. W. Barr Brown, Esq., surgeon, dressed seven wounds, two of which were very deep, and bled profusely.

I wrote to W. Barr Brown, Esq., who very politely obtained and sent this day, Sept. 18th, 1857, the whole particulars in writing, from the young man's father, Mr. George Longhurst, of Sunning Hill, which I give as I receive it.

"Particulars of an encounter with a fish, in the month of June, 1850.—One of my sons, aged fifteen, went with three other boys to bathe in Inglemere pond, near Ascot Race Course; he walked gently in the water to about the depth of four feet, when he spread forth his hands to attempt to swim; instantly a large fish came up and took his hand into his mouth as far up as the wrist, but finding he could not swallow it he immediately relinquished his hold, and the boy turning round prepared for a hasty retreat out of the pond; his companions who saw it also, scrambled out of the pond as fast as possible. My son had scarce turned himself round when the fish came round behind him and immediately seized his other hand, cross-ways, inflicting some very deep wounds in the back of his hand; the boy raised his first bitten and still bleeding hand, and struck the monster a hard

blow on the head; the fish then turned his tail to the top of the water, and went down out of sight; the other boys assisted him to dress, bound up his hand with their handkerchiefs, and brought him home. We took him down to Mr. Brown, surgeon, who dressed seven wounds in one hand, and so great was the pain the next day, the lad fainted twice; the little finger was bitten through the nail, and it was more than six weeks before it was well; the nail came off, and the scar remains to this day.

"A few days after this occurrence, one of the woodmen was walking by the side of the pond, when he saw something white floating in the pond; a man on horseback rode in and found it to be a large pike in a dying state; he twisted his whip round him, and brought him to shore. Me and my son were immediately sent for to look at it, when the boy recognized his antagonist immediately; the fish appeared to have been a long time in the agonies of death, as the body was very lean, and curved like a bow. It measured 41 inches, and died the next day, and I believe was taken to the Castle at Windsor."

There can be no doubt but this fish was in a state of complete starvation; if some of his scales had been examined with a microscope, his age might have been ascertained; and if he had been well fed, it is proba-

ble, I think, he might then have weighed from thirty to forty pounds.

Trout are also voracious after their own species; a gentleman angling at Bakewell, saw a large trout holding in his mouth another smaller than himself, which he had seized across the body, and was so much absorbed by his efforts to secure and swallow his prey, that the angler, by the dexterous use of his landing net, secured them both.

The next sense possessed by fish, which claims attention, is that of feeling; externally, from the nature of their scaly covering, they can have but very little about the body, and taking the whole of their formation into consideration, and that they are amongst the class of cold-blooded animals, the sense of feeling cannot be very acute, or can pain inflicted upon them be very lasting in duration, for if wounded with a hook, or even one remaining fixed in the mouth, the same fish will attack a similar bait immediately, a fact well known to anglers of any experience; at the same time it may be taken into consideration, that the greater the proximity of a nerve to the part where the hook enters, the wound must necessarily inflict more pain than if the instrument were imbedded in a less sensitive portion of the mouth; and this may account for the difference in the exer-

tions of some fish from others, when they are hooked. Boys living near a trout stream are great adepts in catching these fish by tickling them. A rather ludicrous circumstance happened relative to this mode of taking fish. I was approaching Hack Bridge, near Carshalton, one morning, on my way to a private water, when I found there three gentlemen, who were about to angle, with worms as their bait. Though their tackle was good for that purpose, I saw that two of them did not know how to use it, and they made no secret of their incapacity; the third assumed an oracular bearing, and dictated to the two neophytes; as they were getting their rods put together, a boy who had been lying on the grass close to the river, approached with a trout struggling in his hands of about a pound, and asked the head of the party if he would buy; which he did most eagerly for a shilling. I left them, fished till evening, and having taken a place in the coach, I found on entering it the would-be angler and his two friends, whom I had seen in the morning, but it being quite an *en passant* affair, he did not recollect me; he asked me if I had had any sport, and I shewed him two brace of beautiful fish which called forth their admiration. I, in return, enquired what success they had met with; he replied he had caught a very fine trout. "What!" said I, "beside the one you bought?" His friends and

two other passengers laughed at, and joked him all the way to town. It appeared he had persuaded his friends to buy tackle and go out with him for a day's fishing, he assuring them of excellent sport, whereas none of the three had the satisfaction of having had a *nibble*. This mode he adopted of obtaining fish is called jocosely "catching fish with a silver hook." A lady who had probably heard this observation, but did not know its meaning, one evening in company, was boasting of the excellence of the rods, lines, &c. of a relative of her's, and finished by asserting, "that he had amongst his unequalled tackle, a number of *silver hooks*, which were sure to catch fish when nothing else would do so!"

Having endeavoured, concisely, to explain the anatomy of the senses of fish, and shown how acute those senses are, it becomes necessary to consider and examine how these senses, or the organisation of the brains of this class of animals, contribute to give some of them apparently a species of intellect, or reasoning power. It was believed from the time of Aristotle up to a recent period, that man had the largest brain of any animal, and thereby had the vast superiority over all other created beings; further research has proved this opinion to be erroneous, for the proportion of brain to the body in some birds exceeds that of man, and several mammalia, and some

animals of the mouse kind, equal the human subject. Sommering has furnished another point of comparison, which appears to be correct, namely, the ratio which the mass of the brain bears to the nerves issuing from it. Let the brain be divided into two parts, that which is immediately connected with the sensorial extremities of the nerves, which receive their impressions, and is, therefore, devoted to the purposes of animal existence. The second division will include the rest of the brain, which may be considered as connecting the functions of the nerves, with the faculties of the mind. In proportion, then, as any animal possesses more of the latter and more noble part, that is, as this intellectual portion exceeds that of the external senses, will the powers of mind be more clearly developed: thus man stands pre-eminent!

The motions and habits of some created beings are regulated by certain innate feelings, which are generally denominated "instinct;" this means an inherent mode of action, without choice or reason. From the nature of the medium which is the natural habitation of fish, the most anxious and careful naturalist is prevented from acquiring more than a very superficial knowledge of the habits, propensities, modes of life, communications with each other, which, as some live in society, called gregarious fish, it is probable

they have some mode of mutual communication; why should they not? Birds and insects have! see the article on bees, wasps, and ants, in that elaborate work on Entomology, by Kirby and Spence. These associations of fish may arise from the similarity of their required food, and the necessity for selecting particular parts of rivers congenial to their requirements: this instinct or necessity will direct them to do. The male and female salmon pair, they play about the part they have selected, then jointly make furrows or nests for their impregnated ova, which they conceal by covering them carefully, and if disturbed and obliged to leave the spot, will return to it again: this is all instinct; but when the poacher speared and carried away the male fish, and the female went to a pool at some distance, and, impelled by sexual desire, induced a fresh male to return with her to the same furrows, and eight or nine male fish being thus captured by poachers, she returned each time to the pool to obtain a fresh male, and the last time finding no male salmon, she brought a large male trout: this was proved before a Committee of the House of Commons. How she communicated her amorous feelings to the male fish, by what blandishments, persuasions, or arts she induced him to follow her, we are totally ignorant, but it will, I think be granted, this was beyond instinct; that

could not provide a remedy if the male fishes were taken away by poachers, therefore it must be reflective reason that dictated her visits to the pool, and induced her, on finding no more salmon, to select a fish of the same genus and sex, to complete the impregnation of the ova.

Dr. Pallas, who devoted seven years to travelling and investigating the natural history and actual state of Russian Tartary and Siberia, by command of the Empress, states, that during the floods in the river Volga, the rats, which are numerous on the banks of that river, ascend the small trees for safety; the beljugas (a species of sturgeon) shakes these trees so violently with his tail, that the rats in consequence fall into the water, and are devoured alive by the fish, who adopts the same methods to obtain the unfledged crows. Must this not be considered as reasoning upon causes and effects? There are the rats or young crows in the tree, the fish cannot get up to them, but he calculates if he shake the tree, the rats or birds will fall into the water, and he will then obtain them. This is not mere instinct! Dr. Pallas also says, that the shad will tear a net to rescue other fishes when they are caught!

See the anecdote relative to the minnow and tench, p. 199; there appears something very much like reason in the action of the minnow; and it is a well

known fact that fresh-water fish of prey will no attack a tench, so in that way they show their gratitude to the Esculapius of their race; an example which—if some of our *deceased nobles* had followed, would have enhanced their reputation, by shewing a sense of *gratitude* for benefits received.

Eels, it is well known, require mud, into which they retire for warmth in winter, and they will leave any pond, the soil of which does not afford them the shelter they need, by any means, even travelling over short distances of land,—but this is instinct.

Carp, according to Blumenbach, have the largest brain of any fresh-water fish; and it is a well-known fact, that they will force their nose into the soft bottom of a pond or river, and not move though the leads of a net sweep over them, and so escape. They are very difficult to catch by angling; but whether they purposely cut the line with the saw on the front of their dorsal fin, must be a matter of conjecture.*

Oppian's Halieuticks, Book iv. verses 60 to 80, says, the scaro (see Willoughby, 304) pairs with one mate only, and if either happen to be caught with a hook

* Oppian attributes the same act to the anthies if the line be allowed to become slack. Book iii., verse 455—462. (Anthies, Anthiæ, Willoughby, p. 325. Plate x. figs. 3, 4, 5.) The last very like a carp.

and line, the other will gnaw the line, and set the captive free. Or, if one enter a weel and be caught, the other will, with companions of the same genus, force their tails between the twigs of the weel, in the manner of a wedge, and the imprisoned fish takes hold of a tail thus thrust in, to cause the twigs to diverge from each other, and passes out. Is not this a proof of intellectual reasoning? These fish, according to Oppian, have strong feelings of friendship; and the ancient fishermen used their knowledge of the passions of fish to ensnare them: an amusing account of one device for the purpose, but too long to quote, is in book iv. verses 90 to 110.

In Mr. Hugh Miller's work, "Foot-prints of the Creator," an account of the dog-fish shews the intelligence they possess to avoid being captured. They keep aloof from, but follow the net of the fishermen, and as soon as a few herrings are shaken loose from the meshes, they dart upon and devour them; and in the deep-sea white fishing, a pack of dog-fish will watch beside the boat, and will carry off the lower part of the hooked fish, so as to avoid the swallowed hook, and thus deprive the fisherman of a great portion of his fishing; it is observed that sometimes a fresh pack of these fish will come to where the first have been cautiously waiting, and as soon as that occurs, mutually jealous of each other, the whole

rush on forgetful of their former caution, and eager to secure a portion of the prey, they swallow the whole fish, and so become hooked themselves.

The passions of jealousy and violent anger are forcibly illustrated by the article relative to the stickleback, which also shews the arrogant pride of the conqueror, and the effect of grief of the vanquished fish at his humiliation.

Oppian says the wruss is a polygamist, and so it will seem is the stickleback. When trout find themselves encircled by a net, they endeavour to leap over it; to frighten them from doing so, the fishermen beat the water with poles. Oppian says, barbel will do the same; book iii. verses 140 to 150. Salmon, when hooked, will leap out of the water and endeavour to break the line with their tails. Is this action of the trout and salmon mere instinct? We want a second Oppian to investigate the natural character and habits of fish; something may be learned by placing them in vivariams, but very little in a state of confinement.

That fish form attachments of a most lasting description, is proved by the following:—"Fish that are kept in jars, when they have been awhile together, contract so great an affection for each other, that if they are separated, they become melancholy

and sullen, and are a long time before they forget their loss"—"Phil. Transact." vol. ix., p. 323.

"Mr. Anderson put two ruffs into a jar of water about Christmas, and in April he gave one of them away. The fish that remained was so affected, that it would eat nothing for three weeks; so that fearing it would pine to death, he sent it to the gentleman on whom he had bestowed its companion. On rejoining the other, it ate immediately, and recovered its formeri briskness."—Ibid.

There are many examples which might be adduced. The question is, whether this was love or friendship; if the fish were of different sexes, it must be the former; if of the same sex, the latter passion. See also Burton's "Anatomy of Melancholy," vol. ii., p. 125, 13th ed., 1827. "Fishes pine away for love, and wax lean."

There are probably ninety-nine persons out of every hundred, who see fish rise to the surface, or sink to the bottom, in rivers or glass globes, without reflecting how those movements are accomplished. It has been supposed by some scientific men, that these motions are effected by the swimming bladder; this viscus has several coats possessed of great muscular power, which enables the fish to contract, or expand it at pleasure, and as fish have about the same specific gravity as their native element, a dilation of the air-

bladder would make them lighter than water, and they would rise; whilst a contraction of it makes them specifically heavier, and they sink; and fish have, as is believed, this power of dilation and contraction. I cannot consider this explanation as being wholly correct; for instance, the shark, which has no air-bladder, yet ascends and descends with the greatest rapidity, by the aid of its powerful tail, and pectoral fins; and in the mackerel, by its muscular formation, and by the great strength of its tail it does the same. Flat-fish have the power of locomotion by their side fins, which work like a species of Archimedian screw, for they have no air bladder; the same is observable in the fins of eels, and was particularly evident in the gymnotus electricus, hereafter noticed.

A glandular substance exists at the upper part of the air-bladder, containing blood of a florid red colour, shewing it to be highly oxygenated, and from this source probably the oxygen gas contained in this bladder is supplied; according as the vital action of the gills, and the pressure upon the surface of the fish's body is increased by descending to great depths, so the air-bladder contains more oxygen, even to being wholly of that gas; or, it may be from their power of decomposing water that the oxygen is obtained.

Some naturalists think that the quality and quantity

of the gaseous contents of this bladder are increased or diminished by secretion, or absorption, according to the wants or desires of the fish.

According to Biot, fish which inhabit very deep waters have, in this bladder, 87 per cent. of oxygen; and Fourcroy asserts, that in those which are found in more shallow streams, such as carp, roach, and others of that species, there is an excess of nitrogen. The extended experiments of Humboldt, and M. Provenzal, during many months in hot climates, proved that the composition of the gas in this bladder varies in the same animal, under the circumstances I have mentioned, and that the sword-fish which inhabits the lower strata of the sea, has been found under the tropics with its air-vessel entirely filled with oxygen.

Some fish have two processes which go from the air-bladder, and terminate in the fauces; salmon have an opening from the same vessel into the œsophagus, which is controlled by muscular fibre; trout, also, have a similar conformation, and when they rise to the surface in a dull stream, they emit a bubble of air. The whole of this part of the anatomy of fish more fully and impressively illustrates the truth, that consummate wisdom alone could have devised any arrangement so wonderful in design, or so beautifully useful in effect.

Mr. Parkes entertained the opinion that fish have the same power to decompose, and exist upon the decomposition of water, as vegetables; and to prove his position, he cites the case of a fish which was kept in a vessel, and had no food given to it during three years, at the end of which period it had increased in size so much, as to be too large for its domicile. This he considered a satisfactory and confirmatory evidence of the fact. Now with every respect for that excellent chemist, I cannot consider this any proof of the correctness of his theory. Water, I admit, is decomposed by vegetables, and resolves itself into gas, but this sort of food would never fatten a fish. No! It is the large quantity of animalcules there are in water, upon which fish in a state of confinement exist; and as it could not live in that state unless the water were frequently changed, so there must be a constant supply of animalcules. To prove that my opinion is correct, place a fish in distilled water, or in filtered water, or spring water, either of which decomposes as readily as any other, and he will very soon die in the first, and will not live long in the two latter.

The utility of the air-bladder of fish to the human race, appears to be completely overlooked in many parts of the world, where it might be prepared to benefit the inhabitants. Fish glue, or isinglass, is

made on the banks of the Volga, from the air-bladders of the sturgeon, in this manner: the bladder is cut open lengthwise, and exposed during a short time in the sun; the internal membrane is then separated from the external, and placed in a wet cloth or mat a whole day, then cut into pieces, rolled up, and dried in the shade. One species of this fish produces a more valuable article than another; the best formerly obtained at Astrachan £7 17s. 6d. per pud of thirty-six pounds English; the other from £5 12s. 6d. to £6 15s. An inferior sort of fish-glue is made from the air-bladders of barbel.

The shad, which was formerly very common in the Thames, so as to give a name to a portion of the banks of that river, "Shad Thames," and did not exceed eighteen inches in length, attains in the Volga the great length of six feet, and weight of 120 pounds. The air-bladders of these fish are very useful to the naturalist to cover bottles in which animal preparations are to be preserved. The skin of this fish being thin and smooth, like that of an eel, spread and dried is as transparent as horn, is sold to the country people, especially among the Tartars, to form their windows. The air-bladders of fish in our part of the world are small, and usually thrown away; but they may be worth saving and boiling down into a glue useful for many purposes.

The natives of the part of the Russian empire, near the Volga use the fish glue medicinally, and in some instances it appears very successfully. A case is given by Dr. Pallas, in his travels, of a woman passing through a wood with her husband, and being taken in labour; the child was born, and by the administration of fish glue, so restorative were its effects, that she was enabled to proceed safely on her journey in a very short space of time.

Few persons of any age, station, or calling, or even sex, can be found who do not feel great gratification in seeing fish caught, either by angling or by nets, although they themselves are not anglers, or do not take an active part in the sport. Upon one occasion, many years ago, when I was a boy, the waters of the Wey Navigation were about being let off into the Thames, in order to perform some repairs; when Lord Viscount Milsington, the eldest son of the Earl of Portmore, part proprietor of the navigation, most of the land bounding the brook, and landlord of our mill, some of his servants, my father, myself, and six of our workmen, were congregated together about three o'clock on a fine summer's morning, to net the Bourne Brook, near Weybridge Bridge, in which it was supposed some fish which had escaped from Virginia Water, when part of the cascade gave way some years before, had found a home. Nets were placed

at the outlet of the brook, and as the water was reduced, nets were drawn through the deep holes, and the fish thus pressed endeavoured to escape over the shallows; a large pike was doing so, when one of the men who had old shoes on, but no stockings, having a basketful of fish in his hands, tried to kick him ashore; and whether the man brought his leg against the pike, or the fish bit him, as he declared, I cannot positively say, but certainly the man's leg was badly wounded; seeing this, and the blood flowing, I ran into the water, and with a stick killed the pike, which weighed nearly seventeen pounds. In "Bentley's Miscellany" for July, 1851, it is stated that men wading in a pond have been attacked by this freshwater shark. Lord Milsington, seeing a large carp coming over the shallow, also went into the water, borrowing my stick, and killed him, weighing above twelve pounds, and an immense quantity of arge fish were taken by the nets.

A few days after this, whilst the water was still down, and there was a dam across the tumbling bay of the Guildford Canal, some of our men, all work being suspended, and some of the navigation men, who had finished their part of the repairs, agreed to lave the bay-hole dry, in order to get the fish. The hole was like a large inverted cone, built so with large chalk stones, but not cemented together. The

men went to work with great spirit, and as they got the water lower, the buckets, the contents of which were thrown on the nearly surrounding sand bank, from whence the water ran into the river, were found to be half white fish, and the place was crowded with the children of the poorer villagers, who obtained as much fish as they could carry home. When the water became more reduced, the men were able to get into the hole, and caught a large quantity of carp, perch, pike, and eels, the latter from two to four pounds each, which had left their retreats amongst the chalk stones for want of water, and came rolling down into the hole. The men were taking off their shirts to make bags to hold their fish, and some had done so, when just at the moment when the excitement of the actors in the scene, and that of the spectators was at its height, and those who had laboured so hard were obtaining their reward, some lover of mischief, or some one who was jealous of the success attending those who had undertaken the work, broke the dam, and the men, children, and all concerned, were obliged to scramble out of the way of the rushing water as quickly as possible. It was not known who played off this trick, else I think he or they would have had a chance for a swim in the bay hole, for the anger of the disappointed labourers was increased by the laughter of the numerous spec-

tators, and formed such a scene as could not easily be forgotten by those who witnessed it, as I did.

Soon after this, I became acquainted with the son of a farmer, who rented part of the grounds formerly belonging to the ancient Abbey of Chertsey, and went with him occasionally to net the stews wherein the monks formerly kept and fattened their fish. He had three flue or flow nets; one he placed across the stew, another further on, and the third about an equal distance from the second; he had two poles with a round piece of sole leather, about four inches diameter, nailed on the small end. With these poles, leather end downwards, repeatedly plunged into the water, we disturbed the fish, who, in trying to escape, ran against the nets, and generally a good basketful of carp, tench, and perch rewarded our trouble.

The monks were believed to be very luxurious in their modes of living, and, it is traditionally said, fatted their carp. A nobleman gives this as one of the recipes of these gentlemen for attaining that object. It is probable they did use means to increase the size and flavour of the fish placed in their stews in the vicinity of the Abbey. This might be accomplished by removing fish to a clear water, and none could be more so than the stews above-mentioned, connected as they were with the Abbey river. Fish, it is well known, in a state of moderate confinement

will feed freely, and the monks no doubt took advantage of that knowledge.

To fatten Carp.—"Barley meal, half a gallon; chalk, in powder, one pound and a half, very clean; clay, a sufficient quantity to make a stiff paste. Place this in the stew or pond, in a net, not too small meshes, suspended about a foot from the bottom. When all is sucked away but the clay, place fresh in the net, or nets."

Now, how the carp are to suck away the barley-meal and chalk, leaving the clay behind, appears difficult to understand. Probably, barley-meal, chalk, flour, and honey, would be a better compound, apportioning the quantity to the number of fish.

The carp should be kept by themselves, or tench may be in the same stew, and fed with the same food. The pike, perch, and eels, should also each be in separate stews; the first fed with large live gudgeons, small roach, dace, or lampers, cut in pieces; the second and third, with malt, soaked in sheep's blood, live minnows, or moderate-sized worms; but the dead articles of food should not be more than the fish can consume, otherwise the water will become putrid, and there should be a gentle current of water constantly passing through the stews.

In this way, fish might be obtained far superior in point of nutriment and flavour, and so rival those

which graced the tables of the monks of olden times. Stews and ponds were common, to enable those who lived at a distance from the sea, to satisfy their consciences by eating fish on fast days.

Carp were in England when Dame Berners wrote on angling, published in 1486; therefore, it is untrue that they were introduced by Leonard Mascal, temp. Henry VIII.

As some persons may not understand what a flue or flow net is, the following description may be useful. It is a fine net, an inch to an inch and a half meshes, double the depth of the water intended to be fished, and a yard or two wider. On each side of this net is one of coarser twine, and very large meshes, about six inches deeper than the water. These three nets are joined together to a cord at top and bottom, the former having large perforated bungs, fixed at certain distances, strung on it; the latter, oblong, perforated bullets, secured in the same way. By this, it will be seen that the middle net hangs loose, and the moment fish are disturbed by the poles being plunged into the water, they try to escape; in doing so, they run through the outside large meshes, and striking against the inner loose net, it enwraps them like a bag; thus they are caught by the gills, and the more they struggle the more securely they are held. These poles are useful in

taking up the net, for the person on one side holds the leathern end of the pole over to his companion, who fastens the top line to it, when the net is drawn across. One net will answer in a less degree: place the net across, and go a considerable distance from it before you begin to beat the water, and beat up to the net, or two persons each beating up to the side of the net next to him; the moment a fish touches the net, the bungs begin to dip under. This kind of net is calculated for narrow, nearly still waters.

I was walking in a field between Chertsey and Laleham Ferry, before it was inclosed, one very hot day, and approaching a small pond covered with broad-leaved aquatic plants, which pond was connected with the Thames by a ditch, then almost dry, I saw something moving amongst the leaves, which I thought were large frogs, as I saw plenty of small ones about the place; but looking closer, I saw they were good-sized pike, which were lying with their snouts just even with the surface of the water. I went home, heated and straitened a large cod hook, made the point very sharp, reduced the barb, and made it a sort of cutting edge, made the end of the shank a little taper, hardened the whole again sufficiently, thus making a sort of harpoon, whipped a length of strong line to the middle of it, fitted a piece of wood into the top joint but one of a stout trolling

rod, into which piece of wood I had bored a hole a little way, to receive the shank of the hook, so that it stood at a right angle with the rod; I went back, put up my tackle, and struck my harpoon as it might be called, into the flesh, just behind the head of a fine pike. The harpoon slipped out of the hole, as I intended it should, and I hauled out on the grass my prize, which weighed above five pounds. I caught by the same means two more that day, not quite so large; the next day, one of six pounds; the weather then changed, and I got no more. I believe these fish went up into this pond when the water in the Thames was high, after the frogs; the water fell, and their retreat was cut off: they must have found plenty of food, for they were in very fine condition.

We had in our waters about the mill, great quantities of pike, and seeing the devastation they caused amongst other fish, I destroyed them whenever I could by trimmers, snaring, shooting them with a rifle, or any other means I could adopt. These fish have, I am informed, committed great ravages in the river near Canterbury; in the Colne, near Drayton, and Cowley; in lochs Caterine and Lomond in Scotland, and in many other rivers, and waters where there are trout. And I advise all anglers to show this voracious fish no mercy.

There was, and is I believe still, outside Oatlands

Park, in Walton Meadows, near the bridge, a piece of water, which, during the floods, cannot be distinguished from the Thames, and being a little distance from the impetuous torrent, in the time of the annual floods many fish take shelter in that more quiet water; but when the river retires within its banks, they cannot get back to the stream from whence they came. A gentleman, I am credibly informed, being told there were some pike in that water, went with plenty of gudgeons, and absolutely killed forty-one fish in two days, some of them from nine to ten pounds weight each; he used snap hooks, in consequence of the quantity of weeds in the water.

I was at my paternal home during about eighteen or twenty months, and devoted all my leisure to catching fish in every possible way, except netting; I had eel pots, grig pots, and laid trimmers. I had a skiff, and a punt; and probably a few observations upon these subjects may be useful to those having waters of their own, who may wish to entrap eels or pike. The mode of preparing the bait for a trimmer, it is not necessary to enlarge upon, as most know how to do that; but as was the case with our waters, where anybody could walk on one side of the stream, though they could not fish, it was necessary to lay trimmers so that no person could see them. The trimmers I used were made of a forked stick cut

from a tree, in the shape of the letter V, each arm about four inches long; at the point of the fork, a strong piece of plaited cord to be made secure; this cord should be two feet in length. Upon the two arms, wound cleet fashion, *i.e.* in and out, from fifteen to twenty yards of stout hempen line, if platted the better; a good sized round bullet with a hole in it should be placed about ten inches from the bait, and stopped by a large knot from going any nearer to it, but there must be no knot above the bullet; one of the arms of the forked stick must have at the end a shallow slit, which will fit the line not too tightly. Attach the forked stick by the cord from the point of it, firmly to a brick; unwind four or five yards of line, affix the bait, throw it in to the extent of the line unwound, the remainder being retained by the slight pressure of the slit, or cleft in the arm of the forked stick, and then gently drop in the brick. This is a method of securing your trimmer from any intruder, who would probably walk off with your tackle, and any fish it had hooked; or, if you are sure no person can pass where you have placed your trimmer, it may be pegged to the bank. The manner of its action is thus:—A pike or eel takes the bait across his mouth; the act of his doing so, disengages the line from the cleft in the end of the forked stick, he runs off some little distance, the line

offers no check, or the bullet either; he turns the bait and swallows it head foremost—the hooks glide down with it. As soon as he has done so, he moves away; the hooks then begin to act; he finds himself a prisoner, and he must be a powerful fish indeed to pull a brick far from the place. In the morning, having marked the place, drag with a small grapnel, and most probably you will find either a large eel, or a pike on the hook: it is necessary to be cautious in laying the trimmer, that it is not in the vicinity of roots of trees, weeds, &c.; for if a large eel take your bait, he will entangle himself and the lines so completely, that he will die there, and your trimmer is lost.

In attempting to take up two trimmers, I was once placed in a most perilous situation. I had rowed up our backwater, to a very deep hole, into which a volume of water descended over a bay. I had, overnight, placed two trimmers in an eddy by the side of the deep hole which I had pegged to the bank securely: in the morning, between three and four o'clock, I took my gun, and accompanied by a spaniel, as I often shot a wood-pigeon or two, got into my skiff, and rowed up to the bay hole; there was an increase of water, and I had to pull hard. Just as I had got near the bay, and was guiding the boat towards the spot where I saw my lines being shaken violently; at that moment I felt the boat had struck

upon one of the old piles and it began to spin round, when, as the head and stern came alternately near the bay, the water, about three or four inches deep on the bay piece, poured into my boat; my dog, not liking such a shower bath, jumped overboard, and swam down to the mill. I saw my danger; there was I in a pool between thirty and forty feet deep, surrounded by precipitous banks, and I, only a novice then in the art of swimming. I stood up in the bow of the skiff, struck the point of the hitcher into the bay piece, gave a jump, and off glided the boat, but I was obliged to leave my hitcher behind. I then sat down to the sculls, pulled the skiff up again, avoiding the pile this time on which the keel had before rested, caught hold of my hitcher; by shaking, got it out, took up my lines, rowed down to the mill, got some dry things out of the counting-house, cleaned my gun, and went home to breakfast, presenting my father with the result of my morning's adventure, without saying a word about it, a pike above eight pounds, which he sent to our worthy rector, and an eel of three pounds, which we had fried, as part of our dinner.

I was very successful in taking grigs and eels by pots, and any one who takes the trouble may be so, if he bait and deposit them properly. First as to baiting, take some dew worms, or small pieces of raw meat, suspend them across inside the pot by a piece

of copper wire, and place the pot with the mouth so as to receive anything forcing its way up stream, as soon as the weather becomes warm in spring and in summer, for eels then run up against the stream; but when the weather becomes of a lower temperature in autumn, they run down the stream, and the position of the mouth of the pot must be reversed, but in places where it cannot be choked up with dead leaves floating down. If some gudgeons or small dace are put in the pot, a pike, or sometimes more, of one, two, or even three pounds, will get in. Take care to have the plug at the end well secured by a cord or pin, or it may slip out, and all your fish escape, as happened to me one morning when I had full thirty pounds weight of fine eels in the pot; after that, I had a pin which went through the plug. In spring the pots should be made of green osiers, and used till winter, having fresh green osiers for the next spring, if you wish to be successful.

Eels of considerable size will escape through comparatively small orifices: I made a trunk to keep eels alive, which I bored full of moderate-sized holes with a centre-bit, and attaching a chain, and locking it with a copper-warded lock, previously placing therein about fifty pounds weight of small eels, but all too large, as I thought, to get through the holes I had made. Next day I wanted to give some away,

but they were all gone, and to mark the places of their exit there were round most of the holes a coating of slime. I immediately enlarged all the holes, and cross-bradded them, after which no eels escaped.

This fish has always been held in high esteem as a delicate nutritious article of food, from the earliest periods to which we can trace. NIGEL, who states himself to be the "first *consecrated*" Bishop of Ely, appointed to that see in 1133, and who was also Treasurer of England under Henry the First, in his Charter to the monks of Ely, amongst other things gave them twenty-three thousand eels, to be taken in the marshes and waters of the Manor of Stuntney, which he gave them, and six fishermen with their dwelling houses. And the fisheries of Sion Abbey, in the time of Henry the Seventh, with the adjacent islands in the Thames, (given to that religious house by Henry the Fifth), with the breed of hogs belonging to the abbess and her nuns, were of considerable importance to those pious ladies. One of these islands is believed to be Eelpie Island, and there is reason to think that eels formed a great portion of their fisheries. (See the collector's account of Sion Abbey, in the public records.) But when Henry the Eighth dissolved that abbey, amongst others, the abbess and nuns *sunk* (?) the islands, for there is no account of them amongst the possessions

of that religious house, as stated to Henry the Eighth.

Nigel, in his charter, stigmatises the conduct of his predecessor very strongly: he commences by saying he is the "*first consecrated*" Bishop of Ely, thereby leading to the inference that there was no former bishop authorised to exercise the episcopal functions. Now, there was "Hervey," who was Bishop of Bangor, from which see he was ejected by the Welch, and was then appointed by the King to take upon himself the government of the Abbey during the vacancy. The last abbot, who was of royal parentage, had obtained a license from the King (Henry First), and the consent of the Pope, to convert the abbey into a bishopric, but died before the change was effected; this man, Hervey, revived the proposed idea of the change, and induced the king to make him the first Bishop of Ely; he having been Bishop of Bangor, had been as a matter of necessity consecrated, and did not require any repetition of that ceremony, therefore the assumption by Nigel of being *first consecrated* Bishop of Ely was priestly arrogant impertinence.

By the charter of Nigel he gave the monks one measure of land with five acres of woodland, and eight acres of meadow, whereon the oxen may feed, which draw the wood, and their vineyard in Ely,

(*i.e.*, in the Isle of Ely), as they (the monks) held it before it came to the bishopric: he also gave them thirty-thousand herrings of Dunwich.

Abbess Etheldreda, in 673, founded the church and monastery of Ely, and was the first abbess. She was the daughter of Anna, King of the East Angles; she was first married to Tondberct, Prince of the South Girvii, and afterwards to Egfrid, King of the Northumbrians. The second abbess, in 679, was Sexburga, her sister, married to Erconberct, King of Kent. The third abbess, in 699, was Eormenilda, their daughter, married to Wulphere, the first Christian King of Mercia. These are mentioned to show that celibacy was not necessary for an abbess of that time. The monastery consisted of religious persons of both sexes, and continued in a flourishing state under several abbesses till 870, when it was destroyed by the Danes, and lay in ruins; but was in 970 restored and filled with Benedictine monks under Brithnoth, the first abbot. Thurstan, the seventh abbot, was appointed by King Harold, and held the Isle of Ely seven years against William the Norman, commonly called the Conqueror.

In the Avon, near Bristol, I went with a friend to see a most curious sight—the appearance of myriads of elvers, at a flood-gate or lock; they were so numerous that the river appeared solid with them for a consider-

able distance around, and there were a great number of persons, men, women, and children, dipping them out by means of fine sieves, baskets covered with very coarse bunting or muslin, or other contrivances, and depositing them in pails, pans, and washing tubs; many large ones I saw more than half filled.

I had some put into thin batter, and cooked in a good quantity of boiling lard, which is then about 600 degrees of heat, and they were excellent. They must be still more delicate if cooked in the manner white bait are, which one of our first luminaries of chemistry told me was as follows:—a deep vessel of *boiling* lard is kept in that state, in the kitchens of houses which have a great demand for this luxury, the quantity required is placed in a vessel of wire, and let down gently into the boiling lard, and the fish come up fully cooked and quite dry. The above elvers are about two to three inches long, from the thickness of a small straw to a large one, and the quantity of these fish continued quite as great during three or four days. In the river Parrot, Somersetshire, which runs up through Bridgewater, they are found in great abundance; also in the Mersey, about Warburton, and near Northwich they are in such plenty that the farmers catch them to feed their pigs.

Dr. Brookes states that the young of the conger eel are taken in the Severn, about Gloucester and Tewkes-

bury, on dark nights in such swarms, that they are caught in nets prepared on purpose, and made into cakes.*

That I might try every kind of fishing, I was induced one fine warm evening in the middle of summer, to accompany a person to "*bob for eels.*" The method of doing so is by a hollow leaden weight of a conical shape, from half a pound to a pound, according to the water, with a hole through its centre, and a number of holes round its base; a quantity of brandling or other worms are threaded on worsted, and hung in festoons from the bottom of the lead; the cord which passes through the lead has a large knot to secure it from slipping, the other end of the cord is fastened to a tolerably stiff taper pole, seven or eight feet long; two "bobbers" are seated in a boat, one at the head, the other at the stern; a grapnel or anchor is let go in about five feet of water, as the tide is running up. You each let down your lead and bunch of worms, and in a few minutes you pull up gently, and when at the surface of the water rapidly bring the lead over the boat, when two, three, or more little eels will fall off into the boat. Some persons catch a large quantity that way, but one trial was enough for me. It is said the worsted catches

* In the Museum of the Royal College of Surgeons there is a mass of these elvers preserved.

in the teeth of the eels, but it is more probable, that their voracity induces them to hold on to the worms till out of the water. This same method may be practised from the shore.

Sniggling is another method of taking large eels, during hot weather, in the middle of a bright day, which is thus performed. A stout needle, not too long, the eye broken off and ground to a point, is prepared; to the middle of this needle, point upward, a piece of fine gimp about a foot long is to be neatly whipped, so as to leave the greatest portion of the needle free, the gimp to have a loop at the other end; a small bent pointed wire is to be fixed into a piece of wood, made to fit the ferule into which the top joint of a light rod enters; the gimp is to be made fast, by a water knot, to a stout platted line, on a bank-runner, a maiden lob-worm is then to be drawn up on the needle, beginning a little below the head, and leaving a porton of the tail loose; the pointed wire is then to be inserted where the needle enters near the head of the worm, and by adding or diminishing the joints of the rod, the worm can be guided a very little way into a hole in the bank, or between piles, or holes in planking, or any place where it is likely an eel has domiciled himself. Withdraw your fine bent wire after you have deposited your worm, of which you must not lose sight; if an eel be there,

the worm will gradually disappear, being sucked in by the fish, and the line will be drawn in; when you see this, draw the line tight, the eel will close his mouth, then give a smart jerk, the point of the needle sticks against the side of the throat, and as the fish pulls, gets quite across it, and holds him fast; he will adhere firmly to his resting-place by the convolutions of his tail and body; keep the line tight, but do not attempt to draw your line in beyond that; force the point of your bank-runner into the ground, and take a turn over the pin that is used to wind it up, taking in line as the eel gives way; by degrees he will yield a little at a time, till at last he is out of his retreat, land him, detach the gimp from the line, and pressing the eel's throat, the head part of the needle, which has been sharpened on purpose, will pass through the skin, and may easily be drawn through. The great advantage of this mode of fishing for eels is, that if there be not one in the hole, there is no danger of getting foul, as if a hook had been used; that you can use this method at a time of the day, with the sun out, when you could not successfully angle for other fish; and that your prize is worth having, being generally from one pound and a half to three pounds. When a dam was made above and another below Thames-lock, all the water was pumped out of the lock in order to perform some repairs; several,

indeed many, bushels of eels were taken, which crept out from behind the wood-work, as the water became low, and, at the mill where a piece of brick-work of the foundation had fallen, and caused the formation of an enclosed space, an eel was taken weighing above six pounds; he was completely enclosed except in one or two places, where there were small interstices, and probably had existed there during several years, for though small fish and insects could enter the place, and no doubt served him for food, yet there was no place through which an eel of a pound could pass outward. I once caught by sniggling, an eel, through a hole in the planking, called the apron of the mill conduit; by degrees I drew his head to the hole, which was not large enough to let him through, and I had to take off my shoes and stockings, and making my line tight, get down into about two or three inches of water, and cut the hole large enough to let him pass; he weighed above three pounds. Eel fishing begins 21st of April, and ends 29th October.

I had once an eel in the well of my punt, weighing rather over four pounds; wanting him, and not having my punt net at hand, I took off my coat, stripped up my shirt sleeves, and tried to catch him; after a considerable trial I grasped him, when he turned, bit my other hand between my forefinger and thumb, as I was endeavouring to secure him, and drew blood.

After that, I contrived eel tongs, whereby an eel can be held with ease to the fishermen, enabling them to pick out any eel from the well of a punt, or to handle an eel in any way; they are very useful to every person fishing for eels, or having ought to do with these unmanageable fish; and I have lent mine to many persons as a pattern, and also to Mr. Anderson the fishing-tackle maker, of 71, Long Acre.

A method of killing eels has been recently communicated to me, by an old sporting gentleman, which is, to make a longitudinal cut with a small sharp knife immediately behind the head, direct through the spine, which can be easily effected, the eel being held by these tongs.

The generation of eels was considered by the Greeks, according to Oppian, to be by the intertwining of their folds together, which brought off a kind of slime, and that descending to the bed of the river, vivified, and became a host of *eelets*. Aristotle states, that there is no difference in the sexes of eels. Pliny asserts the same thing, and says that they rub themselves against rocks and stones, and so detaching particles, or scales from themselves, these particles vivify, and become young eels; some modern naturalists think they are viviparous, others are of opinion, and *correctly*, that they proceed from ova, the same as other fish.

Mr. Young, of Invershin, states, that he has bred eels from the ova and milt of a male and female eel. And a magistrate of the county of Salop declares, that he has seen a lump taken out of an eel the size of a nutmeg, which being placed in water, gradually separated and proved to be young eels, which swam about. As there are several species of eels, and both these authorities are unimpeachable, may not some eels be oviparous, and others viviparous? (Walton's "Complete Angler," Edited by Ephemera, note, p. 181.)

Eels go down rivers into brackish water, or probably into the sea, in the autumnal months; whether they return to the fresh water is a matter of doubt. Eels also migrate from one pond or river to another, during rainy weather, by wriggling amongst wet grass from place to place.

Ammodytes Gosnere, the sand eel, or launce, is a small fish, seldom a foot in length; the males are the largest in size; they are delicate as food, and excellent as bait for other fish; they lie from six inches to a foot in the sand of the sea shore, and are caught by raking with a kind of hook made on purpose.

The conger eel is found in the sea; it is often caught of a very large size; it is sometimes taken by the French fishermen eight to ten inches in circumference, and five to six feet long, and is so strong in its motions, that it is always killed as soon as pos-

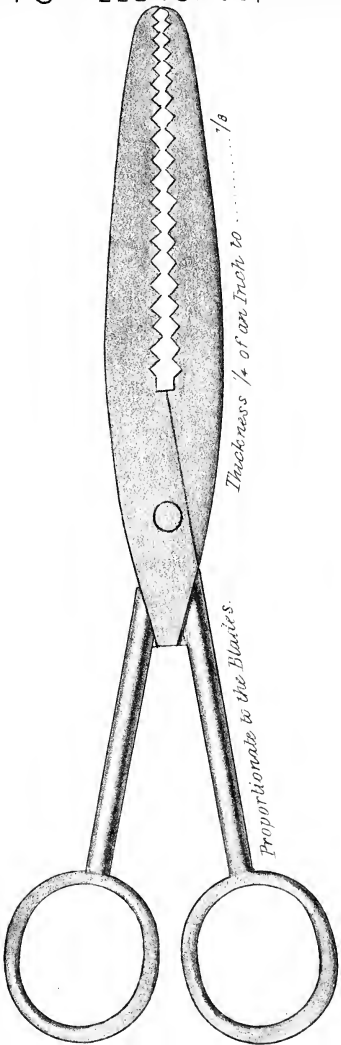
sible; the poorer people eat it, and when cut open, salted, dried and broiled, it is not a bad adjunct at breakfast.

At St. Helena, these fish attain an immense size, and are caught by the residents very frequently; more than one person has lost his life through being dragged into the sea by these fish. I knew one person who had tied his line to his arm, a practice not uncommon there, I am told, amongst those who fish for these eels of a night; his bait was taken by one so powerful, that if he had not fortunately had a knife with which to cut the line, he must have been drawn into the sea.

According to the "Annual Register," 1769, January 21st—A conger eel of an enormous size was sold to a fishmonger at Billingsgate, for five shillings; it was seven feet in length, and to the middle of the body was as large as the thigh of a stout man, weighing upwards of 100lbs. This extraordinary fish was discovered by the people of a peterboat, on the shore somewhere below Gravesend, who had the dexterity to land and throw a net over it, which intercepted the eel from recovering the river. Without this method, or some weapons, it could not have been overcome, as the conger will, when attacked, bite his assailant in as desperate a manner as some dogs.

Oppian relates a curious device the Grecian boys

WRIGHT'S EEL TONGS, OR FORCEPS.



practised, to catch eels, in some of the small inlets of the Mediterranean. A sheep's gut was allowed to descend into the water; the eel sucked down the end, and then began to tug, which giving the signal to the boy, he immediately with the whole force of his lungs distended the gut; the eel's throat and stomach became so oppressed by the expanded substance, that he had no power of resistance, and was drawn a captive to the shore.

In the Appendix, No. 2, to the "Conspectus of the Pharmacopœias," by Anthony Todd Thomson, M.D., F.L.S., &c., &c., the conger is thus mentioned amongst the poisons: — "This fish, although it is frequently eaten with impunity, yet has, in some instances, produced all the symptoms of Cholera Morbus, succeeded by paralysis of the lower extremities." The treatment he advises, "evacuate the contents of the stomach, and after having allayed their irritability by opium, dilute freely with saccharine and acidulous liquids; and bleed, if symptoms of inflammation of the lower bowels supervene."

Dr. Brookes says, "The flesh is very white and sweet, but not easy of digestion; it was greatly esteemed by the ancients, and does not want its advocates among the moderns, especially when it is fried."

There being so great a variety of this species of

fish, some of them may, like the common eel, be injurious to persons of a delicate constitution; the dark flat-nosed eel, imported from Holland, is of that character. As to the conger commonly taken, I have had in early life much opportunity of observation, and I never knew or heard of any person being seriously, nay, even slightly affected from partaking of this fish in moderation; but, like all other species of fish, it should be eaten as soon as possible after it is killed; or if then salted and dried, is not a bad adjunct to the breakfast table.

Dr. Pallas states, that in no river, lake, or pond in Siberia are there any eels; but there are plenty of quabs. As this was a fish I had never heard of, I consulted various Dictionaries, but in none of them could I find the word, except in Bailey, where the name is said to be derived from the Dutch, quabbe, a fish; otherwise called a water weasel. At the Royal College of Surgeons searches were made in vain, and an enquiry published in "Bell's Life," failed in eliciting the information which I sought. I then wrote to Mr. Boccius, and he immediately sent me such explanation as enabled me to refer to Willoughby, p. 125, plate H., No. 6. Yarrell gives the English name of this fish, vol. i., p, 273, "eel pout."

Eel pout or burbot has a smooth, soft, slippery body,

like an eel; in colour resembles the tench; the head is a little flat, and both jaws are well furnished with small teeth. On the lower jaw grows a barb about half an inch long, and there are, likewise, a short pair between the nostrils and the snout; the tail terminates in a circular figure. This fish is found in the Trent, Severn, Ouse, Esk, Skern, Tees, Cam, and some of the rivers in Norfolk; it seldom exceeds two pounds weight, but will live in lakes as well as rivers; in the former, namely, in the Lake of Geneva, it has been taken as large as seven pounds weight; but it is not known to inhabit any of our own large standing waters. It is a well-flavoured fish, and is in its nature extremely hardy. It is very prolific, so much so, that one fish has been known to contain a hundred and twenty thousand ova. Its places of resort are the same as eels, and the time to take them is after a storm of thunder, lightning, and heavy rain; the best bait is a small gudgeon, and the hook should be tied on gimp. These fish lie pretty close during the day, and as the night is the usual feeding time of these fish, therefore they are generally taken with night lines, or trimmers.

These observations are extracted from Dr. Brookes' "Art of Angling," and the "Practical Angler," referred to in these pages.

As this is a very hardy fish, and good as food, it

might be introduced into some of our ponds, or rivers, such as the Mole, the Wey, &c.

Mr. Gmelin states, that the Tschoulyon Tartar women wear boots made of the large skins of the eel pouts. "Trusler's Habitable World described," vol. iii. p. 240.

The Gymnotus Electricus, or electric eel, which was during many years one of the numerous attractions to the Royal Polytechnic Institution, was a most curious specimen of the eel tribe. This one was small when first exhibited to the public, with another, supposed not to be exactly of the same species; neither of them increased much in size, until one died; since which the survivor attained the weight of nearly forty pounds. It was of a most beautiful bright red colour about the head, and part of his body; and his under fin, along the whole body, played like an Archimedian screw. He was supposed to be blind; which is not uncommon to eels when they grow to a large size, two being caught weighing twelve pounds each, in Cheshire, many years ago, both of whom were blind. The electric eel was fed every day with *live* fish, which he killed the moment they touched the water; he used to eat about thirty roach and dace a-day. The man who attended and fed him, was of opinion the fish knew him; it used to cost about a pound, or a guinea, a week, to find

him in food; his water was changed once a week, and was kept at the constant temperature of from 76 to 80 degrees of heat.

Professor Faraday, with several other scientific gentlemen, I was informed, caused him to be irritated, and then tried his powers with a galvanometer, and found he could have killed a horse. He was, very properly, placed out of the reach of any incautious visitor.

This curious fish does not appear to have been known to the Greeks; the cramp fish, known to them, was a flat fish, of a dirty yellow colour, resembling sand or gravel, the body almost circular, with an irregular straight tail. This cramp fish of the ancients, or torpedo of the moderns, if we are to credit Oppian, would take a bait—as he gives this description of the effect upon the fisherman, who happened to hook him—

> "The cramp-fish, when the pungent pain alarms,
> Exerts his magic pow'rs and poison'd charms,
> Clings round the line, and bids th' embrace infuse
> From fertile cells comprest his subtil juice.
> Th' aspiring tide its restless volumes rears,
> Rolls up the steep ascent of slipp'ry hairs,
> Then down the rod with easy motion slides,
> And entering in the fisher's hand subsides.
> On ev'ry joint an icy stiffness steals,
> The flowing spirits bind, and blood congeals.
> Down drops the rod dismist, and floating lies,
> Drawn captive in its turn, the fish's prize."

Book iii. Canto 205 *et seq.* Oxford University edition, 1722.

"Annual Register," 1767.—From the "Memoirs of the Academy of Sciences," at Paris, M. Muschenbrock, a celebrated naturalist, says, in a letter to the Abbé Nollet, that a fish, or kind of eel, is found in a river of Surinam, which has the singular property of giving a shock like that of a Leyden phial. Persons in a boat, even eight or ten feet off the fish, if they dip their hands in the water, receive a shock; if it be touched with a stick, the person so touching it feels the sensation, but not so strongly as when touched with an iron rod, then the shock is very severe; but when touched with a stick of sealing wax, no shock is felt. Fishes swimming past this eel, are killed by the exertion of the power inherent in it. It is called by naturalists, Gymnotus; by the Dutch, Beef-aal; by the French, Anguille be bœuf. It is about four feet in length, and nearly the size of a man's arm.

M. Richer, in the account of his voyage to Cayenne, speaks of a fish in size and effects like the before-mentioned, and says that by striking other fishes with its tail they are set asleep.

In the "Annual Register," 1769, is a quotation from Mr. Bancroft's "Natural History of Guiana," in which is an account of a fish he calls the "Torporific Eel;" he describes it as being about three feet long, and twelve inches in circumference, near the middle;

covered with a smooth skin of a bluish lead colour, and entirely destitute of scales. The head is equal in size to the largest part of the body, but somewhat flat on the upper and lower sides, and its upper surface is perforated with several holes like those of a lamprey eel; the upper and under jaws extend an equal distance, terminating in a semi-circular shape, and forming a wide mouth without teeth; on the back part of the head are two small fins, one on each side, which, like the ears of a horse, are either elevated or depressed, as the fish is pleased or displeased. From about eight inches below the head, the body gradually diminishes in size to the tail, which ends in a point without a fin. Under the belly is a fleshy fin, about half an inch in thickness, and near three inches wide, extending from the head to the point of the tail, but diminishing in width as the body diminishes in size; this, with the two fins on the head, are all that are found on the body of the eel, which would be nearly round if deprived of the belly fin.

This fish frequently respires, and elevates his head above the surface of the water every four or five minutes for that purpose. When it is touched with the naked hand, or by a rod of any metal, or even a stick of some heavy kind of American wood, it communicates a shock perfectly resembling electricity,

commonly so violent, that few are willing to suffer it a second time.

A similar kind of fish was said to be found in the environs of the city of Para, on the southern shore of the Amazons. The torporific eel is eaten by the natives. These appear to be the most early accounts we have of this genus of fish.

In the "Catalogue of Apodal Fish of the British Museum," pp. 141-2, there is an account of this genus of eel. It is therein stated, that its powers are so great, that it can slay both men and horses. The organ of this wondrous power is in the fin-like substance along the under part of the tail; that its powers are exhausted by use, but its energies are renovated by repose, and nourishing food. It is further stated, that two were brought to London in 1842, neither of them weighing more than one pound; and in 1848, one had attained the weight of 40lbs., and the other of 50lbs.

A very interesting account is given in "Humboldt's Travels;"—"The gymnotus is found in abundance in the confluents of the Oroonoko. It was difficult, however, to procure the fish, as the Indians dread the shock which they are liable to receive in taking it. The Indians believe that the gymnoti may be touched with impunity by a man chewing tobacco, but their faith in this precaution is not practical. The Indians drove above thirty wild horses and mules into a stag-

nant pool." Humboldt thus describes the struggle which ensued. "The extraordinary noise caused by the horses-hoofs, makes the fish issue from the mud, and excites them to combat. These yellowish and livid eels, resembling aquatic serpents, swim on the surface of the water, and crowd under the bellies of the horses and mules. A contest between animals of so different an organization, furnishes a very striking spectacle. The Indians, provided with harpoons, and long slender reeds, surround the pool closely, and some climb upon the trees, the branches of which extend horizontally over the surface of the water; by their wild cries, and the length of the reeds, they prevent the horses from running away, and reaching the bank of the pool. The eels, stunned by the noise, defend themselves by repeated discharges of their electric batteries. During a long time, they seem to prove victorious; several horses sink beneath the violence of the invisible strokes, which they receive from all sides, in organs most essential to life, and stunned by the force and frequency of the shocks, disappear under the water. Others, panting, with mane erect, and haggard eyes, expressing anguish, raise themselves, and endeavour to flee from the storm by which they are overtaken. They are driven back by the Indians into the middle of the pool; but a small number succeed in eluding the vigilance

of the fishermen;* these regain the shore, stumbling at every step, and stretch themselves on the sand, exhausted with fatigue, and their limbs benumbed by the electric shocks of the gymnoti. In less than five minutes, two horses were drowned; the eel being five feet long, and pressing itself against the bellies of the horses, makes a discharge along the whole extent of its electric organ. The horses are probably not killed, but only stunned; they are drowned from the impossibility of rising amid the prolonged struggle of the other horses, and the eels. When the gymnoti have expended their electric energy, they approach timidly the edge of the marsh, where they are taken by means of small harpoons fastened to long cords; when the cords are very dry, the Indians feel no shock in raising the fish into the air. In this manner, several were captured and examined; some measured 5ft. 3in. in length; and the Indians assert, they are sometimes of much greater length. The gymnotus is the largest of electrical fishes; and its electrical action is so powerful, that Humboldt says, that he does not remember to have ever received from the discharge of a large Leyden jar, a more dreadful shock than that which he experienced by imprudently placing his feet on a gymnotus just taken out of the water."

* This is called by the Indians, "Fishing with Horses."

At a meeting of the British Association in Dublin, (see "Athenæum," 5th September, 1857,) Professor G. Wilson read a paper on the Employment of the Living Electric Fishes as Medical Shock Machines. He stated that the living torpedo was employed as a remedial agent by the ancient Greek and Roman physicians, and in proof that it was so used previous to the Christian era, he quoted Galen, Dioscorides, Scribonius, and Asclepiades; of the last there were two: the first, fifty years before the Christian era; the other, ninety-eight years after; but as to the writings of either of these two, I have in vain enquired for them. Scribonius flourished A.D. 10, and Dioscorides A.D. 60. Of Galen, I shall speak presently.

In 1843, at Berlin, was published a dissertation entitled "Quæ apud veteres de Piscibus Electricis exstant Argumenta: Auctore Æmilius du Bois." This is in the British Museum. Hippocrates is mentioned as the first to describe the torpedo, and he speaks of them as serviceable in certain diseases, but only as articles of diet. Scribonius says they may be applied in cases of head-ache and gout. Pliny and Dioscorides, who were nearly contemporaneous, praise the therapeutic properties of the torpedo. Plutarch speaks of the properties of this fish, but not of its therapeutic application. Galen speaks of the therapeutic uses of this fish, when applied externally. Now

Galen was born A.D. 131, and died 201, consequently flourished at Rome during the reign of the Emperor Severus, who was born A.D. 146, succeeded to the throne A.D. 192, and died A.D. 211. Oppian (mentioned in the introduction) was born A.D. 183, and died A.D. 213; probably recited his Halieuticks, when he was about twenty-five, before the Emperor and his son Caracalla, and he mentioned the cramp-fish, in Book i. verse 151, as causing "numming pains." In Book ii. verses 109 to 152, in giving an account of the arts of this fish to obtain its prey, says,

> "One touch of hers dams up the vital flood,
> Contracts the nerves, and clots the stagnate blood."

And in Book iii., verses 201 to 212, describes the effects on the angler who happens to hook this fish, even through the communication of the line and rod only, "as poisonous," as "binding up the spirits," as "stiffening every joint," and "congealing the blood."!* It certainly appears very extraordinary, that Galen, who wrote so extensively, and had only recently died, (*i.e*, about seven years) should have had a "*remedial agent*" which he patronised, stigmatized before the emperor, and with his royal approbation.

Sir J. Richardson may very probably be correct as

* See p. 159.

to there being a number of genera of electric fish ; look at the "Catalogue of Apodal Fish in the British Museum,"—the article "Anguillidæ"—the eel species; no doubt these are for the most part hybrids.

In the "Annual Register," of 1796, referring to Bancroft's "Natural History of Guiana," then just published, is the observation, that these torporific fish have no scales. I am not aware whether they have been examined microscopically.

The natives in those parts where the gymnoti are found, avoid as much as possible receiving a shock from them. It must be a curious scene, and concert, if several of the women of Calabar wash their children at the same time, and in proximity to each other; they must, in the operation of the shocks the children receive from the malapterurus, desire not only to strengthen their limbs, but to expand their lungs by the screaming to which they would, no doubt, give vent.

The common eel is variously estimated as an article of food, and anciently there were supposed to be only four different species of them, viz., the silver eel, the greenish or grig, or greg eel, the red-finned eel, and the blackish eel; this last has a broader, larger, and flatter head, and is considered the worst. The Dutch eels are of this last class. Eels out of clear rivers are most esteemed, and those from Salisbury are parti-

cularly fine. In the Highlands, Hofland says, they are looked upon with aversion. The varieties of the Anguillidæ, or true eel family, are far beyond the ideas of former naturalists. In the account of Apodal Fish, published December 1856, by order of the trustees of the British Museum, there are about forty-five different species. And of Congeridæ, or the Conger family, there are an immense variety; not including in either of these the gymnotus, in which tribe there are probably several, differing one from the other. I was at a place some little distance from London, a few years ago, and was shown two large tanks in a clear river, where I was informed eels were kept; and the story related to me was, that the proprietor of them, when a poor itinerant dealer in eels, used to purchase Dutch eels for about three pence a pound, and sell them about the country, as coming from that beautiful stream, at a shilling or eighteen-pence a pound; he then put his Dutch eels into tanks, and kept them in the river; so that he truly declared they came out of that river, and he made a good fortune by the plan. Many tricks of the kind are played off on the banks of rivers at houses famous for stewed, or spitchcocked eels. Dutch eels placed for some time in a tank or trunk, in a clear river, and fed with small live fish, will lose much of their noxious qualities. The monks of

old, as before-mentioned, no doubt knew and practised these arts.

On the subject of eels, rather a ludicrous anecdote is related. The Right Honourable Lady——, whose mean, penurious habits were well known, which induced her to neglect no opportunity of making what she considered a good bargain, in one of her walks saw a man selling live eels, at a price which she considered very cheap, in comparison with the price she usually paid for them at her fishmonger's; as she was not known, she bought some, which the seller tied up, as he told the lady, securely, in her pocket handkerchief, and she put them into her pocket. As she returned home, she paid a morning visit to a female friend, but had not been long seated, before the eels, disliking their confinement, crept out of the handkerchief into the lady's pocket, and thence, to the dismay and confusion of one lady, and the horror and astonishment of the other, upon the carpet, where their evolutions soon caused the lady of the house to run screaming out of the room; the servants rushed at the alarm to the assistance of their mistress, the eels were secured, and the visitor offered her apologies and explanation; but whether they were satisfactory or not is unknown,—at any rate, the lady who had been *visited*, and her servants told the story.

LAMPETRA MAJOR.—The lamprey eel is sometimes taken in eel pots; I have seen them taken from one to three pounds weight, in the river Lea. In the Severn they are much larger, having been taken, it is said, three feet in length, and five inches in diameter; this fish has no bones, but a gristle down the back, full of marrow, which should be taken out before it is cooked; they are not considered wholesome food. They chiefly live in the sea, but come into the rivers in March, and spawn in April, leaving their brood in holes in the sand, where they are soon endued with life, and in three months after become from three to five inches long. Those which I have seen were speckled very much like many of the snake tribe, and from their appearance, I should never be tempted to eat part of one. They are sometimes caught with a worm, when angling for other fish.

At Rodley, in Gloucestershire, there is a rent paid to the Lord of the Manor, called "Pride-Gavel," by some tenants, for the liberty of fishing for lampreys, in the river Severn.

The ancient philosophers asserted that the sea lamprey formed a sexual union with the land serpent; a curious description of which is given by Oppian, and also of the animosity which exists between the lamprey and the lobster, and of the battles which take place between them when they meet.

LAMPETRA PARVA, et fluviatilis, the river lamprey or lampern, moves about very rapidly in the latter end of Autumn, in the Thames; they do not exceed ten or twelve inches in length, are dark grey on the back, the belly being a bright silver. They are caught in pots in very great numbers, and are excellent baits for night-hooks; they have no bone; they may be seen in shallow places in the Mersey, in actual sexual intercourse. I have been informed that in the Thames *the regular-bred fisherman is obliged to take out an annual license to catch these fish, from some officer of the Lord Mayor, for which each person has to pay a certain annual sum for a license to catch them.* It is a matter of doubt, in my opinion, whether this be or be not an *authorised* demand, from men who have served their time, and are legally qualified to fish; and whether his lordship knows of any such charge. These lamperns are sent to Holland to be used as baits; the usual price is twenty shillings per thousand, and a successful fisherman will sometimes take in a season ten thousand. The season is said to commence on the 24th of August, and end on the 30th of March.

The LEPIDOSIREM, vulgarly known as the MUD FISH, approximates nearer to the eel tribe than any other, therefore I introduce it in this place. There are at present only two species known. The one found in

the river Gambia, in Africa, Lapidosiren annecteus, which is the one that has reached Europe, a living specimen of which was at the Crystal Palace. Perfect unanimity does not prevail amongst naturalists as to whether this animal should be classed with reptiles, or fishes. Professor Owen includes it with the latter. Those of the river Gambia, which do not retire with the overflowing waters, burrow in the mud, which is soon baked hard by the scorching sun; there they remain, in a torpid state, until the return of the rainy season again awakes them to activity (Patterson's "Introduction to Zoology.")

In Dr. W. B. Carpenter's "Zoology," it is stated that this animal from the river Gambia is about a foot long, but those from the large rivers of South America are from two to three feet in length. It was discovered, 1837, in South America, in the river Amazon. Some zoologists place this animal in the class of Ichthyoidal reptiles, whilst others place it with the Anguilliform fishes. M. Natterer places the lepidosiren by the side of the group of sirens, the class of amphibious reptiles; Professor Owen makes it a group of the class of fishes; Desmarest thinks its proper place is near the Cæciliadæ, in the division of amphibious reptiles, and that it thus forms the transition between the class of reptiles and that of fishes. See Lepidosiren, in D'Orbigny's "Dict. d'Hist. Nat.," by E. Desmarest.

Plates of this animal and its anatomy have been published by Natterer, of Vienna; Professor Owen, in the "Linnæan Transactions," vol. xviii., p. 327, 1839; and by Dr. J. Hyrtl, 1845, of Prague.

In the account published by the Crystal Palace Company, this animal is said to possess both lungs and gills, and that it was forwarded from Africa by Captain Chamberlayne.

At the Royal College of Surgeons there have been two dissected by J. T. Quekett, Esq., Histological Professor and Resident Conservator of the Museum.

The peace of Amiens having opened the Continent to the traveller, and I being on a visit at Folkestone, was persuaded to go over in an open lugger to Boulogne, where I remained some little time, and intended to go up to Paris, but unfortunately met with two English persons where I landed, of apparent great respectability and plausibility, who induced me to enter into a speculation with them, in which they robbed me very considerably; and I withdrew from the concern suffering much pecuniary loss, and found, when too late, that neither of them could safely show their faces in England. But, as I have seen, during the course of a long life, villainy generally receives punishment, even in this world, and they had theirs.

One afternoon, I went with an Englishman, who

had resided and remained in that place some time previous to,and during the revolution, over the upper part of the harbour, to find a place to angle, but we were not successful. At low water there were such plenty of mussels near the town, that a cart-load might have been gathered there, and then they would not have been missed. There were few large crabs in the market, but as I saw on the sands, on the other side of the harbour, several large pieces of rock, around which the flux and reflux of the sea had made basins of water; I pulled off my shoes and stockings, drew up my trousers, and as soon as the tide would allow, crossed the harbour; and having a large landing-net, to the staff of which I caused to be added two or three joints, I pushed my net under the hollow of the rock. I soon captured a fine lively crab, nearly eight inches lengthways of the shell, which was quite blue—this, with some difficulty, I transferred into a bag; shortly after, I took another nearly as large. Whilst untying my bag the first escaped, and made for the water; when he saw me approach, he opened his claws, and set up to fight; by the aid of my net I placed him also in the bag. On arriving at home, I had some sea-water boiled, and plunged them into it in the bag, where I let them boil during twenty minutes. When I took them out it was evident they must have fought as I brought

them home, for they had each torn one of the large claws off the other. I often, during the time I remained at Boulogne, when the weather would allow, caught a crab or two in a similar way.

When I first went to France, provisions were very cheap, but the English soon increased the prices, by giving whatever was demanded; and the French traders of all classes, even shopkeepers, were at that time in the practice of asking very much more than they intended to take. A trifling instance occurred which shows the fact, and to what extent even the hawkers of little articles carried their impositions. A girl was carrying about some fine lettuces, the first I had seen that season: I asked her the price of one: "four sous," (two pence) was the reply; this happened at the door of our lodging: the mistress of the house came to the door, and in broken English told me to go in; she then dealt with the girl herself, and bought a dozen of the same lettuces, and picked out the best, for four sous the whole twelve.

I shall not enter into a long detail, but merely notice the following:—a turkey, weighing twelve to fourteen pounds, fifteen pence; a couple of fowls, ready for cooking, nine-pence; a couple of ducks, seven-pence; a hare, eight-pence; partridges, four-pence each; rabbits, three-pence to four-pence; tench about three-quarters of a pound, from a penny to three halfpence

each; trout, same weight, same price, or if not many at market, probably two-pence each; a pike, weighing eight pounds, I bought for fourpence on one occasion, and sixpence on another; and sea fish much cheaper than these, particularly at Boulogne, to which port a great number of fishing boats belong.

I removed to Calais, and shortly after entered into an arrangement of a nautical character, with a Swedish naval captain, who resided there, in which we embarked our money, our time, and exertions; he being a cripple, could perform but little personally. It turned out very successful, until there were rumours of a renewal of hostilities. The English residents at Calais were in a state of the greatest possible anxiety as to the prospect of the continuance of peace: our ambassador passed through on his return to England. Carriages were continually arriving with families who had been residing in, or were passing through France, whose passports were taken as usual on entering the town, and they were told they would find them at the office of M. Mengaud, the Commissary-General of Police. This man was said to be an Irishman; if so, he was certainly *not an Irish gentleman*, but was a low, tyrannical monster, quite fit company for such as Robespierre, with whom it was said he had been intimate. The English, whose numbers in Calais kept daily increasing, could not return even to whence they

came, without this official's signature on their passports, and he was invisible during several days: thus all who had arrived in the town were entrapped. Early one morning, the beginning of May, 1803, the Town Sergeant, accompanied by a drummer, went round the town, beating the drum at certain places, then the usual way of notifying anything in France, and commanded all Englishmen to attend at the house of the Commandant of Calais, at a time specified, that morning. When they went there, they were told that, "As the English government had made prizes of many French vessels, previous to their having declared war against the republic, the French government had decreed that all Englishmen, between the ages of eighteen and sixty, were prisoners of war; that at present Calais was their prison, but they must not presume to pass any of its gates, or they would be made *close* prisoners." As the General did not speak English, through the interest of my partner, I was appointed his interpreter, and a very unpleasant position it was, (though it eventually enabled me to escape,) for I was placed by the General in communication with any of the rich detenues who petitioned him for leave to go through the Netherlands to England, or any other concession they might require; and was instructed to intimate to them that the only way to obtain the favour of the General, was to gain

the good offices of a certain friend of his in the town. Large sums were, I understood, paid to that person in order to propitiate the General; but in every case as soon as all the money, that it was possible to extract from these persons, had been obtained, the drum was beaten round the town, the English were summoned to the General, as imperative orders had arrived from Paris, "*to send all the English up the country;*" a *rascally pretence* to get rid of those who had thus been (as they considered) plundered. The poorer order had long before been sent, or rather commanded to go to Valenciennes. All were obliged to take Mengaud's passport, at the price of three shillings and fourpence each; and some after that ,had only two shillings to find them with every necessary for a journey of nearly one hundred miles. Workmen and artificers, who had been induced to settle in France, were obliged to sell their clothes and tools for a mere trifle; and other instances of horrible misery were daily presenting themselves.

An opportunity offered of sending my family to England, for females and children were then allowed to depart. Accordingly, I agreed with the captain of a neutral trading vessel, for a heavy price, to take my family, with their luggage, to London, where he said he was going. When they had got about mid-channel, this captain told them he should land them

at Dover, or wherever he pleased, and evinced such villanous intentions, as caused them to entertain great fears for their safety; so that a lady, who with her son formed part of my family, waved her handkerchief, and made signs so effectually to an English cruiser, that the captain sent a boat with an officer on board the trader, the explanation given of the conduct of the skipper, that the lady was allied to some of the first families in Dover, and was then, as it might be called, escaping from a hostile shore; that she had a brother-in-law commanding a gun brig in the channel; the captain of the cruiser, who was going into the Dover roads, ordered the trading skipper to land them at Dover, and to refund a reasonable proportion of the sum he had extorted, to pay the difference it made between their being taken to London, as the scoundrel of a skipper had undertaken to do, and their having to travel thither by land. It was in vain the skipper said he would take them to London; the captain of the cruiser, who had caused the former to come on board the king's ship, told him plainly he would not trust him, as he looked upon him as little better than a pirate or robber.

The intention of Bonaparte to inspect different parts of the French coast, was made known by the entry into Calais of about 250 cavalry, on fine horses, well-proportioned men, who, to obtain admission into the

regiment, each must be six feet English measure, and have served six years in some other regiment, without the slightest blemish on his character; these were accompanied by nine Mamelukes, on splendid horses, who were armed with a scymeter, a dagger, a brace of pistols in their sash, a larger brace in their saddle, and a short fusee; these together formed the advanced guard of the escort of the Chief Consul. I became acquainted with some of the officers of the first corps, most gentlemanly men, from whom I had the particulars as to their regiment.

Whilst Bonaparte was at Boulogne, an English frigate fired amongst the workmen then constructing the pier, and drove them from their work. Shot were fired, by his orders, in return; but not reaching much beyond half way, he caused an examination to be made as to the quality and quantity of the powder, and finding it defective in the first, and deficient in the last, which act of peculation and villany so enraged him, that he tore the epaulet from the shoulder of the head responsible officer, and ordered him, and every one in that department, to be placed in confinement; and finding the works of the port had not progressed according to his orders, he broke all the officers, and suspended the operations till he should send persons on whom he could depend.

During all the time I had been engaged in the

nautical concern before-named, I had had a passport, which enabled me to pass through the gates of Calais either way, with any number of persons in my company, at any hour of the night; and as the Commandant often wanted me to go out of the port, or into the Bas Ville, he redated the parchment document, and stated thereon that I was to pass free. This was the advantage I derived from being his interpreter, as thereby I could go out on the port.

Any remittance from England was out of the question, whilst matters were in this unsettled state as regarded the English detenues, and as all I possessed nearly was vested in the vessel before named, upon which the French government first laid an embargo, and then confiscated: whether the Swedish captain obtained any compensation I do not know, I did not; so that I was obliged to be very careful of every *sous*. There was a large canal of fresh water, part of the moat of the fort at Calais; seeing some French boys catch small fish close to the edge, I considered I might obtain larger ones by fishing farther out, and having a very long rod, I tried the experiment, and caught many roach and perch of half a pound each; and by laying eel lines, whilst I was angling, I often added a good-sized eel or two, making very acceptable dinners and suppers, which my knowledge of angling fortunately afforded me.

The inhabitants of Calais, anticipating the ruin of their town, were not disposed to lay out their ready money, except for absolute necessaries, and I had great difficulty in finding purchasers for some philosophical, surgical, and sporting apparatus which I had, except at most trifling prices: I kept my fishing tackle till the last, and only sold it the day before I escaped. My books I could find no purchaser for, so I left them in the care of a Frenchman, who, on my re-visiting Calais, in 1824, gave them to me, and would neither accept any recompense himself, or allow any of his family to do so; he was, like those hereunder, also a Mason.

At length the General, having no further occasion for me, informed me I must also go up the country, to the same place as the rest; I therefore made up my mind to escape, but how to accomplish this desirable object was the difficulty. A variety of plans were discussed by me with the other prisoners; but I found they did not possess the necessary cool determination to ensure success, and therefore I resolved to attempt my own emancipation in my own way. Accordingly, I laid myself on a mattrass, and marked upon that, with a red pencil, the exact size into which I could compress myself; I then went, with a brother Freemason, to dealers in furniture, boxes, &c., and found an old trunk, with two locks, the exact size I required; this I purchased, and only awaited

the arrival of a neutral vessel, which was expected to convey a number of females, children, and Englishmen, who passed as subjects of neutral states, and had corresponding passports. Curiously, whilst we were dealing for the trunk that I bought, we were shown one in which some person, for whose capture a great price had been offered, escaped from England. In about a week or ten days, the Danish brig the St. Anna, Hans Hussen, master, arrived, in ballast, and was to sail for Dover on the 10th of July, 1803. I therefore threw a few things into the trunk, together with a large bag, passed the trunk at the Custom House, and, dressed as a sailor, I placed it very carefully, along with other luggage, in the cabin. My friend went on board, and just before the mustering of the crew by the Deputy Commissary of Police, attended by a guard and the Town Sergeants; the minute examination by the Custom House officers having taken place, my friend, after I had tumbled everything into the bag, and stripped off my jacket, locked me up in the trunk. I had not calculated the expansion of the human body by heat, and he was obliged to place his whole weight on the lid to force it down; he gave the key to an Englishman who had a neutral passport, another brother Mason. There being but very little wind, and the tide running to the eastward three hours after high water, the skipper

cast anchor in Calais Roads. I had been three hours and a-half thus compressed, I suffered dreadfully from cramp, but dared not breathe too hard. My friend on board, who had the key, fearing I should be suffocated, let me out; I washed, dressed myself, and came upon deck. There was another Englishman, who had been brought off by a Frenchman in a sailing boat, which proved the total ruin of the latter, and he was obliged to fly over to England. Thankful to the great Supreme Being who had listened to my supplications, and assisted me so far, and entertaining the opinion that were I taken, my life would not be very safe if I were in the power of the Commandant, I induced the passengers to believe that the vessel would speedily, by the efflux of the tide, be aground; and as several on board knew I was well acquainted with that part of the coast, and all were most anxious to get under weigh for their native land, we made a determined attack on the skipper by gesticulations, for we did not know Danish, or he English, and very little French; I seized an axe, and made signs I would cut away the cable, when he allowed his men to weigh anchor, and trim the sails, and to our great joy got under weigh for Dover, where we safely arrived. As we departed from the French coast, we saw an English man-of-war brig attacking three or four gun-boats, which had crept out of Boulogne, and endeavoured to get into Calais;

and another of our cruisers, of the same class, spreading every stitch of canvass, bearing down to assist in the destruction of these craft. I made our skipper hoist Danish colours, as I was fearful the man-of-war brig, as she neared us, might cause some delay by overhauling us. We had to land at Dover in boats, and the boatmen, many of whom knew me, expressed so much pleasure, not for me personally, but as a principle, that one had escaped from the unjust imprisonment, more particularly in such an extraordinary manner, that they almost disputed who should carry me ashore.

Mrs. Putland, a widow lady, who, with her family of several children, came passengers in the St. Anna, being disappointed of her eldest son's protection to town, through his being on active service, as an officer in the navy, asked me to take his place. I, therefore, remained the next day at Dover, as her coach and luggage had to be landed and cleared; and I had enough to do to answer inquiries made by friends of numerous persons who had been so villanously entrapped. At six in the morning of the 12th of July we left Dover, with four good horses, and travelling post. About three miles before we reached Dartford, owing to neglect of proper greasing of the wheels on the continent, one of the front wheels took fire, which by water from a road-side cottage I

extinguished. I sent the family on to Dartford in a carriage which I desired the postilions to fetch; also a new wheel, and a smith, all which caused a considerable delay, so that when we arrived at New Cross, it was near half-past nine, and we were attacked by a gang of luggage-stealers. By good management, and showing a bold front, I saw the whole family safe to their residence in Manchester Street. To gratify the anxiety of the public, on the interesting subject of the detenues, I sat down one night about ten o'clock and wrote a little narrative on the subject, which by eleven next morning was in the hands of a publisher: the newspapers copied it, and had actions commenced against them by him.

During about twenty-five years after my confinement in the trunk, I suffered from a recurrence of cramp of a most curious character; after getting damp, unusual exertion in walking, &c., the sensation was most painful, and appeared mostly as if the pain were in the marrow of the bone; but I have during many years found an *instant* remedy, and now seldom feel any symptoms of the affection. As it may benefit those afflicted, I give the recipe. Compound camphor liniment, and compound soap liniment, of each one ounce; tincture of Spanish flies, two drachms; tincture of iodine, one drachm: mix, keep in a glass stoppered bottle. Rub some on the affected part

when pain supervenes. My situation in the trunk was of a nature most painful both to mind and body. First, as the brig was swinging round, in order to go out of harbour the proper way, those in charge of the warp did not ease it so soon as they ought to have done, consequently her stern caught the side of the pier, and tore away some of her taffrail, which gave the vessel a little shake; but to me, who was lying confined close to the spot, it appeared something of considerable importance, and, joined with the Babel-like confusion of voices constantly attendant upon the departure of a vessel of a commercial description out of a French port, made the first period of my position not enviable. There were originally two locks to the trunk (my temporary domicile); the one nearest my head I took off, and cut the inner lining away, so that I had all the air that could enter through that orifice. Fancy the situation I was placed in, my knees drawn up as high as possible, the lid forcibly pressing against them, my neck bent, and my chin consequently pressed towards my chest, in a close cabin, in the middle of the hottest of all hot days in the month of July. I once felt an inclination to sleep, but I resolved not to give way to it; independently of all this, the fear of any accidental cause preventing the gentleman who had the key from getting on board, and the whole chain of natural mental anxieties, I was

blessed with courage to endure, by a merciful Providence, whereby I was saved also from suffocation.

Bonaparte had not the full command then, as he had afterwards, and therefore the whole odium of this most atrocious act, a disgrace to any civilized nation, should not justly be attributed *solely* to him; that he felt great animosity toward the English nation there can be no doubt; and this was not to us, who resided in France, a matter of any surprise. Although the peace of Amiens had placed the two nations ostensibly upon friendly terms, the press was continually lavishing abuse and insults upon the Chief Consul, and this he considered as the general feeling of the English people. To a man like him, it must have been, and was, very annoying; our press had no more right to interfere, or make observations relating to him, or his government, than one person has to do so, respecting another's domestic arrangements. The residents in France saw one paper after another interdicted, till at last they all became so; and it was the general opinion at that time, there, that his rude conduct to Lord Whitworth was chiefly induced by the virulence of the English press: if such were the fact, the authors of all the insults on that man, are morally the cause of the deaths of those who perished in the war, from that time till the battle of Waterloo; and after all, for what? Merely to

gratify the morbid taste of those, who are desirous of bringing down every human being to their own low standard of moral worth. There are, unfortunately, too many hireling scribes, and would-be wits, on both sides of the channel, ready to pander to such propensities. I *believe* there *are* some English periodical publications now interdicted in France, I *know* there *were*. Let meddlers beware!

The conduct of the French government was inexcusable as to the detenues. Had the English been taken whilst fighting against the French, it would have been a different affair: but in this case, the visitors were guests of the French nation, they increased the trade of the places they frequented, by spending their money freely; the residents embarked capital in business, and complied with their laws, by paying for a species of patent of naturalization: and then, in defiance of every rule and custom of civilized nations, all were made prisoners. Such were the feelings excited amongst the detenues, and such their desire of liberty, that few, if any, would have hesitated to emancipate themselves, though in so doing they were obliged to sacrifice the lives of any of the opposing employés of the then French government.

When Bonaparte was at Calais, he crossed over in a boat, and inspected Fort Rouge, at the entrance of the harbour, which then mounted eight or ten

24-pounders; the soldiers placed there are relieved when the tide is out, as they then march to it on the land side, and ascend a flight of stairs or steps.

Shortly after my return to London, I was sent for to the office of the Secretary of State, and was introduced to Admiral Sir Home Popham. I was requested to give the whole particulars relative to this fort, which, for some reason, the English government wished to have destroyed; I gave him the width of the openings between the piles upon which it is erected, and this I could do most correctly, as I had often been under it in a boat, after wild ducks I had shot, which had drifted there. My animosity against the French was then so strong, through the loss I had been subject to, and the treatment I had experienced, that I offered, if the means were supplied me, to destroy it entirely. I knew the *risk*, but would then have been gratified to have taken the *hazard*; I am now happy I had not the lives of so many men to answer for. The Admiral attempted to destroy it; but employed such very inefficient means that he merely displaced a plank or two, which alarmed the garrison so as to render any future attempt useless.

I had enough to occupy my energies to repair my losses; and for some time had neither tackle or time to angle. After a short period, by my brother's death, I having become the only son, my father and

mother, who had been estranged from me by misrepresentation, sent me an invitation, and I frequently visited them: when the season for angling came on, I bought a general rod, &c., and there being a great many perch, at that time, in some of my old fishing places I renewed my acquaintance with angling by very good sport in taking perch.

My orthography of the name Bonaparte may, to some, appear erroneous; but I think it is the correct way. In the "*Biographie Universelle*," it is said, that Napoleon the First left out the "u," which had been used by his father, as he wished it to be thought he was more of French origin. Of this there can be little doubt.

When Edward the Third obtained a grant, or probably forced from the clergy a ninth of their incomes for two years, to enable him to prosecute his wars, he did not consider that the clergy had acted honestly by him, and therefore, on a reimposition of the tax, in 1340, the king would not accept the returns of income made by the clergy themselves, but caused assessors and venditors to be appointed, who were to cause the principal parishioners in every parish, on their oaths, to deliver an account of the annual value, and sources of the income of their respective churches; the records of those valuations, with, in most instances, the names of the jurors, for twenty-

seven counties, are in existence, and were printed many years ago, by order of Parliament, a copy of which I have. In the parish of Maiden Newton, in the county of Dorset, one of the jurors was William Boneparte. In other of the parishes, in the same county, Thomas Bonevyle, Robert Bonefeld, Lawrence Bonefaz. In Suffolk, Simon Boneye. In Hampshire, Radulphus Bonebrock. In Wiltshire, William Boneteste, Radulphi Bienacr'. In Cambridgeshire, Walter Bonebrok. In Bedfordshire, Richard Bonebrok, Nicholas Bonebrok, Richard Bonebrok, Junior, Nigel Bonegent. There can be little doubt that the ancestors of these persons came over with William the Norman, when he invaded this country, or after he had gained it; and affords a fair presumption that the family of Bonaparte, was of Norman extraction. Prince Lucien "*Bonaparte*" presented a curious specimen of eel to the British Museum; and Napoleon the First, when appointed Chief Consul for life, was so invested as "*Napoleon Bonaparte.*" See "Histoire du Consulat et de l'Empire," par Monsieur A. Thiers.

The above records are in abbreviated Latin; they are very *curious*, for they shew the origin of a vast number of surnames; and are most *important* to the clergy, as they shew in many counties what tithes, glebe land, belonged then to the church, and must still be its property. These rolls are very little known,

and very few can read them in the original, and those who can read the printed copy are not numerous; they have, in some instances, been brought forward, advantageously, in support of the rights of the church.

Perch are a very voracious fish, and afford excellent sport to the angler. The season for perch and pike is from the first of July till the twenty-eighth of February. Angle for the middle sized ones with a worm, and where they run larger, with a minnow, or small gudgeon; put your hook through just by the back fin, use a cork float. Perch, like the pike, take their prey by the middle, and, in this case, strike as soon as there is a bite; if the hook be placed in the lip of the bait, give a little time to allow the perch to turn the minnow, and swallow it head first. If you intend to fish with worms, a little while before you begin, throw in balls of clay, in which some worms are embedded, with their tails just protruding, and bait with rich brandlings, smelling very strongly, and exuding a yellow liquid, or red worms with a yellow tail; do not give too much time on having a bite, or the hook must be cut out of the fish's gullet; if you take one, you are almost certain of several others, of which this is an example.

A fortunate tradesman, who had retired into the country from the fatigues of business, invited, most pressingly, a London friend, upon several

occasions of their meeting, to visit him at his sylvan residence; and, amongst other inducements, promised, though he was no angler himself, to afford his friend the sport of angling in *his water*. This attracted the Londoner; a day was fixed, and our angler arrived with a full complement of rods, lines, baits, &c., and was anxious to commence;—but no! luncheon was first to be disposed of; after which the host introduced his friend to *his water*, which proved to be a little round basin, not wider than the length of one of the rods the angler had brought with him. As must be naturally imagined, the visitor was disappointed and vexed, though he did not choose to shew his vexation; and, on the assurance that there were perch in the pond, he put his tackle together, and the moment he dropped his bait into the water, he hooked a fine perch; another, and another, followed; and when his friend came to tell him dinner was ready, and enquired as to the success he had had, the angler showed him thirty-five perch. "Well!" said the good-hearted host, "I am glad you have had such sport; I caused three dozen to be put in the day before yesterday." "Oh!" replied the angler, "I will take the other, and then I shall have nothing to do in that way, after dinner."

Another anecdote, arising through perch fishing may be introduced here. A tanner at Esher, having

premises abutting on the river Mole, a stout, good-tempered old bachelor, in easy circumstances, and fond of practical jokes, was asked by the village surgeon, with whom he was on intimate terms, to have some proper ground-bait thrown into the river, in a hole adjoining his (the tanner's) grounds, as he (the surgeon) had a friend coming from London to have some perch fishing; the tanner said, "he would bait the hole." The anglers arrived at the spot, and began; each, on the first swim had an apparent bite, and each lost a hook; this occurring again and again, the surgeon went home without being observed by the tanner's people, and brought a grapnel, with which he pulled up one or two small faggots, in which were tied up pieces of old iron to sink them. He and his friend left the place, and meeting the tanner, thanked him for allowing them to fish, and for the trouble he had taken in baiting the place, but said the perch would not feed, the wind or sun was not favourable, or some excuse of the kind, which disappointed the tanner of his laugh at them. Some time after, on a very hot day in July, the tanner had to ride to London on some business, and returning in the evening, he found it necessary to send his old maid servant for some plaister. The village Esculapius wormed out for what purpose it was required, and persuaded her to take plaisters which he prepared. The tanner

applied them on going to bed, but was soon awakened by intense pain. At an early hour poor old Nanny was called by her master; she put on her spectacles, and exclaimed, "La, sir! why they be two as fine blisters as I ever did see." The surgeon boldly declared, that Nanny explained herself so very imperfectly, that he thought he did quite right in sending what he had done, and so availing himself of the old maid's delicacy, he avenged himself for the trick the tanner had played him, who discovered that he had had the worst of the joke, and that it is dangerous to play with edged tools. The story became known, and the tanner, instead of laughing, as he expected, at his angling friends, was laughed at himself.

In 1813, I joined my family with that of a friend, who had obtained a large house and pleasure grounds, and land, upon very reasonable terms, on the borders of Henhault Forest. Outside our gates, upon the waste, there was a large pond, the water of which was very clear, and the bottom a loamy gravel; a one end there was a clear space, about twenty feet out,—the rest of the pond was full of a wiry weed. My friend's sons, and a young gentleman of my family, though we had two fish ponds in our own grounds, went outside to this pond to fish; in about an hour they caught a large dish full of fine perch; but they lost several hooks, which I attributed to

their inexperience. Next evening I went with them, and my gut line was broken by a large fish; these I thought must be eels, who had entangled themselves in the weeds, and so broken the line; I therefore laid an eel line across a clear part of the pond. I obtained some minnows from London, with which I baited a few of the hooks, but they remained untouched, whilst those baited with worms, were picked clean. My groom, and our gardener, proposed to get in and mow the weeds, it being very hot weather, and the pond not being deep, if I would hire or borrow a net in London. They cut the weeds, and tying ropes to the two ends of a long heavy chain, they thought to pull out the weeds; but the chain began to roll, gathering up the weeds, until, when about one-third of the length of the pond from the end they were proceeding to, the mass of weeds became high above the water, and immoveable. Two teams of horses were at work, drawing timber; I borrowed their assistance, and drew the weeds out. We then put the net through, and took as many tench, from three to seven pounds each, as filled a large clothes basket, which two men with difficulty carried up to the house; we threw in all that appeared under three pounds, and all the perch. Just as we had finished, Long John, one of the foresters, upon his white horse, with his gun across the pommel of the saddle,

came and questioned us. I said, we were upon the waste, and not on the forest; however, a glass or two of strong ale, and a similar quantum of brandy, made all right with him, and he advised us to go to Hog-hill pond, where he said there were immense carp and tench—but we never tried it.

I was induced upon one occasion to angle in a large pond for tench. I caught several about three-quarters of a pound each, but then, on having a bite, I found a large eft, or newt, or asker, on my hook, which had taken my worm. The gardener who owned the pond, said, "Ah! when these varmint begins to bite, the tench leaves off;" and this opinion is confirmed by old authors, whose works I have.

I have generally caught tench by baiting with a worm, but it is said a sweet paste is very excellent, and I have found it so in the Serpentine river; some advise a little tar in the paste, but I never tried it. One of these fish from a river is much superior to any from a pond, unless it have a marly gravel bottom; they do not, commonly, as it is said, exceed five or six pounds weight, but one was taken at Thornville Royal, Yorkshire, which weighed twelve pounds. In the lake at Apse Court, Moulsey, Surrey, I know one was taken above eight pounds; several of those taken near Henhault Forest, as before-mentioned, were full seven pounds.

A tench is said to be the physician of other fish; and it is a well-known fact, that no pike or perch will take a small tench, if offered as a bait; the slime there is on a tench, possesses a healing property, and instinct teaches other fish when wounded, to avail themselves of it, as this instance will demonstrate. Minnows and gold fish, in a state of confinement, impelled by hunger, eagerly seize a small common fly. A gentleman, who was unfortunately unable to leave the house for some time, through an accident, on whom I often called, amused himself by making small artificial flies, which he did very neatly; he kept some minnows, and a tench about two inches and a quarter long, in a very large wide-mouthed bottle; all the minnows had died, except one; my friend was just finishing a fly as I went into his room, and he held it upon the surface of the water in the bottle, as he was often in the habit of doing; the minnow darted at it so rapidly, that he could not withdraw the fly in time to prevent the hook from pricking the minnow; the little fish descended three parts of the way down the bottle, poised himself for a moment, with his nose pointing downwards, then swiftly went the remainder of the way, rubbed his nose during a few seconds against the side of the tench, who remained perfectly quiet, and then the minnow swam about as lively as before. We both

joined in the opinion that it is really no fable, as to tench being the Esculapius of fish; for here was an example before our eyes, of a fish being wounded, and immediately instinct directed him to seek a remedy.

As a lad, I thought myself fully acquainted with angling, for I had seen little or nothing of fly-fishing; beyond dibbing, my success was so great as a bottom fisher, that my father's pocket suffered very considerably, as I caught much more fish than could be consumed by our family; and my father sent, as presents to our numerous friends in London; to one a bagful of eels, to another a brace of carp, to a third a large pike, to a fourth a dish of perch, to a fifth six or eight dozen of gudgeons, and these presents were often varied, and repeated; and he always paid the carriage, and seldom had his baskets, &c., returned. I had several trunks for keeping fish alive, so that I could make up a handsome present of fish at almost any time. In conversation with a lady of rank, to whom I had been introduced on one of my visits to town, the subject of angling was mentioned by her, and she said there were many river fish that she had never seen; I replied, that I would send her a brace of every fish that inhabited our waters, with their respective names marked on them; which I did, with a dish of gudgeons and a bagful of eels.

But a change came over the spirit of my dream; I was to see a new phase in the art of angling. A physician who had married a lady of large fortune, several years previously, came on a visit of a few days to our house; this gentleman was a fly-fisher, and almost thought any other way of angling derogatory to him, though he did condescend, on one or two mornings, to go out in a punt, gudgeon fishing. In the evening, the fisherman took him nearly down to an ait on the opposite or Middlesex side of the river, about two-thirds of the way across; a square stone with a ring in it was then dropped, attached by a rope, from the stern of the punt, which caused the punt to move slowly down stream, and enabled the angler to throw his fly near the osiers; he caught a great number of chub, from one to four pounds, and one trout of three pounds. I was delighted with this mode of angling, the *ne plus ultra* of that fascinating art, but I had neither tackle, or knowledge sufficient; and other busy scenes of life awaited me, distant from my peaceful, paternal home, which I never again inhabited, except upon a visit of a few days at a time.

In 1805, I became acquainted with a Welsh gentleman, Mr. L., whose description of fly-fishing for trout and sewin, fired again my imagination; and I determined to become a fly-fisher. I bought a rod,

winch,* line, and flies for the purpose, and went out with him several times to the Wandle, and by degrees, learned to throw a line sufficiently well to take some trout; I then went up the Thames to my well-known locality. Many a poor little dace did I astonish, by sending him over my head as many yards behind me, as he had been, a minute previously, before me; and frequently a large fish had the advantage of carrying off my fly, with the gut attached, through my striking too forcibly. In trying to get out a long line, I was often annoyed by hearing a crack behind me, something like a coachman's whip, denoting that my fly was gone upon a voyage in the air, of which I had lost all control; and as I was totally ignorant of fly-making, I became a very good customer to the fly-dresser. With all these disadvantages, I succeeded in taking some large chub; and one evening, upon a shallow, then existing near

* Never use a multiplying winch; it has no power to control a large fish. By long experience I have found that a well-made plain check winch is much superior. I have one, the interior of which was taken out by a clock-maker, and replaced by a well-hammered wheel and check, so regulated, under my direction, as to require four ounces to cause the handle to move; therefore I never fish with the hand upon my line. In striking, the resistance is quite sufficient to fix the hook in a fish, but not sufficient to break the tackle; if you hook a small fish, he is not liable to be pulled out of the water; and if a large one, the line runs out under the slight resistance offered by a retaining power of four ounces.

Thames Lock, I hooked and killed a trout about two pounds.

Soon after my return to town, I took my fly-rod, &c., and went to the Horse and Groom, at Lea Bridge, and caught a chub or two in the water at the tail of the mill. I went round to the mill head, and saw a neat little man on the Barge Walk, dropping his fly very cleverly under some willows, and taking several chub, a pound or more each; his rod was shorter than mine, and he threw a greater length of line than I, at that time, could have accomplished; but which I afterwards did easily. I entered into conversation with him; invited him to take tea with me in the house; we afterwards went to the mill tail, and he, in the most unassuming manner, pointed out my defect in fly-fishing, which was too much impetuosity. He was rather astonished when he found I could not make a fly, and giving me his address, (Mr. H.) said, if I would call upon him, he would have great pleasure in teaching me. He was highly respectable, and I invited him to my house; he came and taught me how to dress a fly; explained the difference and advantages of hackles out of a live cock, over those taken after the fowl is dead—which is, that the former keep their elasticity in the water, and the latter collapse, and become like a rag. This is well understood in France, in regard to beds;

one made of *live* feathers, if you press your hand down into it, rises again, and shows no mark of the indentation; whereas one made of *dead* feathers, leaves the full mark of the indentation; and if the price of the latter be forty francs, the price of the former would be eighty or a hundred francs. I am not the apologist of the persons who obtain these feathers for *live* beds, or of the methods they use, which I am told are cruel; not so, however, is the method of obtaining *live* hackles, they are carefully plucked out, one at a time, and are no more than pulling a hair at a time out of a man's or woman's head; they are in perfection the latter end of September, or all the month of October. The hackles from some cocks are most beautiful, light or dark duns, speckled with gold-coloured spots; some of these spots are so minute as to be seen only with a magnifying glass; these from the necks of hens, which make up cloak fashion as it is called, are also highly prized. Live hackles of all descriptions Mr. H. had in great numbers, and I believe he crossed the breed of fowls, to obtain many of them; and on any angling excursion he made into the country, he invariably purchased, if to be sold, even at a high price, any curious bird which would yield feathers of that description. He was very liberal in his gifts of feathers to me, many of which I still have; and after his death, which I shall presently mention, his son

kindly added from his father's stock to mine. Mr. H. proved to me that most fly rods were too weak in the middle; that when held out horizontally they drooped too much; he could not find a rod that suited his ideas, so he obtained tools and made his own; he pointed out to me the necessity of having the ferrules well hammered upon triblets, (round pieces of steel,) and to protect his rod from the effects of rain, he varnished it with copal varnish. At my request he introduced me to an old Welshman, named David Williams, whom Mr. H. had drilled into making rods according to his plan; this Williams was acquainted with Clark, the unrivalled maker of glued-up bamboo fly-rods; the most excellent of all rods. I obtained about ten sticks of the proper cane, and Williams induced Clark to make one for me, and another for my friend, Mr L.

Williams was a very good angler, but an eccentric character; he always went out fishing by himself; would never tell any one where he was going, or on his return say where he had been; or acknowledge to having caught more than a brace. One day the landlord of the Duke's Head, Wallington, named Webster, a house well known, at that time, to all anglers on the Wandle, was passing a part of the fre water, and seeing Williams, whom he knew, he enquired if he had had any sport. "Na! na!" said

the old man, "the fish wont tuche." No sooner had he uttered these words, than the linen strap of his bag broke, which he had concealed under his great coat, for it was misty weather, and out tumbled upon the grass *twenty-two trout!* The landlord, to annoy Williams for telling such a falsehood, insisted upon holding the bag whilst the old sinner replaced his fish, which done, Webster said, "Do you call these nothing? Why, if the fish had *tuched*, you would not have been able to carry them home."

I continued my friendly intercourse with Mr. H. during many years, and never had cause to regret having formed his acquaintance. I was most deeply grieved when he was deprived of his life at the age of seventy-five, but healthy, and not seeming sixty, through two conductors of omnibuses each pulling him to obtain him as a passenger, when a third omnibus drove furiously up between the first two; to save themselves, the conductors hastily let go their hold of my poor friend, who fell down in consequence, and the wheels of the third omnibus went over him. His leg and thigh were broken, and he was otherwise so injured, that he died very soon after he was conveyed home. Peace to his manes! I have never, in my passage through life, met with a more kind, unobtrusive, upright, and generous man, as far as his means would allow: he was, in fact, a complete personifi-

cation of what we suppose Izaak Walton to have been.

I quite agree with Mr. Rennie, and other authors of celebrity, that the amazing diversity of artificial flies is not necessary. I used generally to find it the most successful mode, to observe what fly was on the water, and to use a fly or palmer of the same colour as near as possible; and if I had not one, to sit down and make it. Palmers made of *live* hackles are very successful, for they resemble a fly in rapid motion which has fallen into the water, and is using its wings to extricate itself, and the action the angler gives it, by the tremulous motion of his rod, completes the deception. Palmers, it is supposed by some persons, are intended to represent the long-haired and variegated caterpillars; but I think the above explanation is more reasonable. Throw into a river one of these last-mentioned insects, it floats down with the current an inert, unattractive mass; throw into a stream a fly of any kind, and a caterpillar, the former will be immediately and eagerly caught by a fish, while the latter will be allowed to pass unnoticed for a considerable time, and probably be wholly neglected.

Mr. L. and myself, in coming home one evening from the Wandle, I having a proper fishing basket, were annoyed by observations and low witticisms on

fishermen, as we passed, which I determined to avoid in future, if possible. I had, therefore, a kind of pouch-bag made, the pattern of which I had from my old friend Mr. H.; this being carried in the pocket, was only called into requisition if fish were caught; whereas a basket is an incumbrance going, and also a still greater nuisance in returning, particularly if you have no fish in it. Next, to prevent the rod being seen as such, I obtained a dark bamboo cane with a root to it, such as is often used for the stick of an umbrella; I had a ferule at the small end, with a cap screwed on, into the ferule fitted the screw of an Irish landing-net of silk, the rim being in four pieces of wood and brass; I had a partition bag for the rod, made of some light material, and when this was wrapped round the centre stick, which projected at top and bottom, even a very close observer would have considered it was an umbrella. At the top of this centre stick I had a female brass screw inserted, to receive a small spear, for the purpose of placing my landing net upright from the ground, to prevent it being trodden on, and also to enable me in trout fishing to see in a moment whereabouts it was. With these arrangements, I could go out or come home without any one supposing I had been angling; but this led to two or three rather ludicrous mistakes.

One day I was caught in a heavy shower on

Mitcham Common, and hastened to the shelter of a cottage; two young ladies, who had also availed themselves of the same accommodation, were standing just within the door, when one said to the other, not intending I should hear it, "*See this gentleman, I suppose he has a new umbrella, and is afraid the rain will spoil it.*" Another time, I had been angling in the Test, and on leaving, with my host and his wife, in a post chaise, for the train, I asked my friend's butler if he had put my fishing rod into the carriage, when he replied, "No, Sir; but I have put your umbrella in;" and was running away to find the fishing-rod, till I stopped him by saying, "it was all right."

I had a few weeks' leisure time, and having an introduction to, and invitation by, a gentleman in Somersetshire, I made his house in the way of my tour. Mr. M. was most hospitable; he had been a surgeon, but had retired from practice several years, having found a method of making a fortune more rapidly. He was a highly talented and educated man, and we became so well pleased with each other, that he would not hear of my departure; in fact, whenever I seriously talked of leaving, he would send a servant down to the outer great gate of his demesne to lock it, and then, laughing, tell me if I were determined to go I must teach my horse to leap his high gate, with the chaise at his heels. A day or two

after I and my wife arrived at his house, I went with his nephew to a river about a mile and a-half off, where I was told there were trout, and I took my disguised fly rod in my hand. The river appeared a deep, sluggish stream, by no means the *beau ideal* of a trout stream, but I was assured there were plenty of that fish in it. We came to a bridge, and there was a country lad, with a hazel rod, something like a cart whip, and a line about half as long again as the rod, trying to throw a great nondescript fly to a bubble, that every now and then was caused by the lazy rising of a trout, but beyond his reach. This Izaak Walton of the village, when we arrived, was just giving it up as a futile attempt: I said, "What, are you going away, leaving that fellow to laugh at you?" "Noa, noa, zur, I'll ha'un to-morrow." "Oh," said I, "I'll have him to-night." "Ho, ho!" shouted the rustic. "What, we' thic thing, thee's brella?" "Yes," I said, and proceeded to set up my rod, placed on my winch, and prepare for action. I put on a red palmer with a yellowish body, then gradually got my line out to a level with where the fish had risen; he made another bubble, and by a quick turn of my wrist my fly was on the spot, and he was hooked in a moment, to the great astonishment of all the yokels who were looking on. He weighed about a pound and a half.

Next day, Mrs. M., who, from her nephew's account of what he saw the over night, began to think highly of my piscatorial skill, proposed that we should make a party to go and angle in the same river. I was informed we should require worms, and lines with floats. We went, but defend me from such trout fishing: we killed about eight brace, of a pound to a pound and a-half a fish. When we arrived at home, Mr. M., who occasionally imitated the Somersetshire dialect, began to jeer us, saying, "What, do'e call thic things trout? come along we' me, and I'll show thee trout, and what's more, I'll gi' thee leave to catch them if thee can, by any mode thee art master of, except netting; and thee may'st begin after dinner." Sure enough, he showed me, in an artificial canal, two hundred yards long, ten feet wide, about six feet deep, and the water so clear that a pin thrown in would be seen at the bottom, some, but not many, very large trout.

During dinner and dessert, Mr. M. laughed, and said he had shewed me trout, but defied me to catch them; if I could, he would acknowledge I was an angler, but not without. After dinner, I found some worms, and as I was going out, Mrs. M. said, "Catch some of his trout, if you can, by any means, but do not let him laugh at us and our angling." He and I went to the canal, I taking with me a strong trolling

rod. I put on a large hook, baited it, and presented my worm to a fine large trout, who turned away, having plenty of food. Mr. M. said, "There he be, why doesn't giv'um thy bait?" At last he went away, laughing; as soon as he was gone, I took off the worm, whipped on two more large hooks in the manner of a grapnel, wound a small piece of lead off a plummet round the shanks, and dropped them very gently a couple of yards ahead of a large trout, brought it gradually underneath his gills, struck suddenly and strongly upwards, caught him fast, and knowing my tackle to be strong, gave him no play, but landed him directly; and as soon as I had taken off my grapnel hooks, and put a single one on, I carried up my fish, which weighed above six pounds, to the house, and shewing it to Mr. M., asked him if he thought it would be enough for that portion of to-morrow's dinner. Mrs. M. laughed; but he stared with astonishment, and for some moments could not speak. At length he said, "Thee art the devil! thee sha'n't fish in my canal any more." "Oh!" said I, "I'll take every fish in it, if you desire them." "No, no! I revoke my license to fish in my canal," rejoined he. Mrs. M. was much pleased, for she had told him not to be so sure that I did not catch some of his overgrown fish. Next day, there were two friends of Mr. M.'s to dinner, and whilst we were at

our dessert, I stated that Mr. M. had defied me, by whatever art I was master of, to catch any of the fish in his canal. I then said, I had found them too well fed to take the bait I offered them, and therefore resorted to another species of art; and producing my triangular hooks, showed how I had beaten Mr. M. He laughed as heartily as any of the rest; and I advised him, if ever he defied another angler to catch his trout, to make a stipulation that it should be by fair fishing.

Mr. M. introduced me to a Mr. W., who had a legitimate trout stream, very much over-stocked, for he seldom took any out for his own use, or as presents, and never invited any one to angle, unless he was quite sure they either were not anglers, or that they had no tackle. I went to his house and grounds one day with Mr. M., who was resolved, with my assistance, to play off a practical joke upon Mr. W. I took with me my disguised fly rod, and whilst Mr. W. was regretting that he had no tackle, or he should have been delighted to have seen me catch some of his trout, I turned to my friend M., and said, "Well, we can go another day angling to where you proposed taking me, and for which I brought my tackle; and as Mr. W. says it will give him such pleasure to see me catch some trout, I will, with his leave, begin." Mr. M. could with difficulty restrain his laughter, and

Mr. W. his mortification. I caught several brace which I laid upon the lawn, and then said, "I hoped I had gratified him (Mr. W.) by complying with his wishes; that I would take one brace for Mrs. M.'s supper, and leave the rest." On our road home, Mr. M. enjoyed the fun, and said he thought Mr. W. would never press any one to angle again, if he saw an umbrella in the hand of the person, lest it should turn out to be a fly rod.

In corroboration of Mr. Rennie's observation before referred to, as to the uselessness of the multiplicity of artificial flies, the following may be confirmatory of his opinion, and I believe of most experienced fly-fishers.

"The inexperienced trout fisher generally encumbers himself with a large book, containing a whole host of flies, for the dressing of which, he has resorted to the fur of every animal under the sun, and the feathers of every bird that cleaves the air! He has materials without end, flies without number, with as many names as would puzzle and confound the most skilful entomologist.

"This is all useless. The genuine trout fisher, on the contrary, takes with him very few flies, and kills as many fish as he pleases. But he is by no means an inattentive observer of every thing,—every indication of weather,—every change in the state of the

atmosphere,—every ripple that marks the whereabout of the fish. The yellow dun for the tail fly, and the red palmer for the bob, are generally sufficient for most streams, with a white moth for the approaching darkness. A few flies of this description, and an extra line or gut-length, wound around the hat for readiness, and the saving of time, are far better than a heavy and useless book of flies. On some occasions, however, it is necessary to be provided with a few materials more closely resembling the flies upon which the fish may be feeding."—("Sporting Scenes and Country Characters, by Martingale." Longman and Company.)

There are, nevertheless, peculiar artificial flies which are very attractive on some rivers; for instance, the river Wandle; no May-fly is ever seen on it, neither do its waters become thick by storms of rain, like the Mole and the Wey, but it has a small fly, which all the London fly-dressers know as the cock-tail. I have departed from the usual shop fly, bearing this name, with great advantage to my sport, by making the two little hairs of the tail, of fibres of the golden pheasants' topping, or blue fibres of the king-fisher; also, by having some of the extreme ends of the bodies of a corresponding blue, or bright yellow.

In the Dartford river, a very dark red palmer, with peacocks' herle, and a little bright yellow at the end

of the body, either finely ribbed, or not, with silver, is, I am told, very killing; but natural hackles, so dark a red, are scarce.

In the Thames, palmers of a tolerable good size, of any description, will take chub and dace; but the fly with which Mr. Brand, a legal gentleman, of Staples Inn, a most successful fly angler, killed trout and salmon in the Thames, was a palmer made of a deep red and black live hackle, body of bright green floss silk, ribbed with gold, and not too small.

I have not had the advantage of enjoying the noble sport of fly-fishing for salmon, but I have often thought of the strange-looking things salmon flies are. I am told they are intended to *imitate* the dragon-fly—if so, they are very poor imitations; however, as I believe the best salmon fishing occurs some time before the dragon-fly makes its appearance, any nondescript substance moving on the surface of the water, like a thing of life, probably proves attractive to the hungry fish.

An angler's weight of fish is often *very erroneous;* there are small neat steelyards to be found at most tackle shops, very useful for deciding any difference of opinion on that point. Sir Humphrey Davy had the butt of his rod marked with a scale of feet and inches, and he said that a trout seventeen inches in length, and nine inches in breadth, would weigh two

pounds; this method of estimating the weight of trout must be erroneous, as much depends upon the superior food to be found in some rivers, beyond what is in others, whereby the flesh of the fish becomes more or less compact and solid.

In 1846 many most *eulogistic* observations were made in a sporting journal, stating that a certain tackle-maker had made some flies of an *improved* description, which proved *eminently* successful in the Thames. I knew the person referred to, and thinking he *might* have found some *novelty*, which had proved as attractive as was *represented*, I went to his shop, to purchase some of these killing flies. The proprietor was out, but his wife, who knew me well, showed me some palmers, made of red and black hackles, with dark bodies ribbed with gold, similar to many I had already. I was disappointed, as there was nothing *new* about them, being similar, only not so good, in my opinion, as some given to me between thirty and forty years before, by Mr. Brand, beforementioned. However, as I had caused trouble, I proceeded to look out a few; meantime, the good lady assured me that, "The hooks were not common hooks, but were made purposely, and peculiarly well *hammered* and *tempered*, and that the bodies of the flies were ribbed with *real gold*." I saw the fallacy of these attempts to impose upon me, and impress

me with a high opinion of these flies, and to enhance the price, so I cautiously selected half-a-dozen. She divided them into two parcels, three being rather larger than the other three, but all, as she assured me, were the *real Thames flies*. The larger three, she said, "I shall only charge YOU *one shilling* each, and the other three *ninepence* each." I suppose it was intended I should consider myself *favoured*; but I did not, for I could have bought as good flies, on as sound hooks, and with as much *gold* (?) on them, at any of the tackle shops for *one shilling and sixpence*, whereas these six *real Thames flies*, so *improperly puffed*, cost me *five shillings and threepence*. But I have never troubled this lady's shop with another visit. I consider myself, and am thought by others, a good fly-fisher, but I never caught one fish, even a chub, with any of these flies.

I must here remark that there is, in point of fact, no such thing as *real gold* lace, or gold thread; it is silver gilt with such a fine film of gold, that it would take fourteen millions of such films of gold to make the thickness of one inch; whereas if fourteen millions of leaves of common printing paper could be placed one on the other, they would make a pillar three thousand nine hundred and sixty feet high, (Dr. Black,) or above nineteen times as high as the Monument. And the ductility of gold is such, that one ounce of it is suf-

ficient to gild a silver wire more than thirteen hundred miles long. (Fourcroy.)

There are so many excellent descriptions of rivers, lakes, &c., published, with an account of the fish they contain, that it is unnecessary to attempt to give directions to anglers relative to them, when that part of the subject has been previously so well explained; I shall therefore merely make observations on those rivers or waters which appear to have escaped the observation of former authors, and of which I can give some account, or have had personal acquaintance with.

Serpentine River, in Hyde Park, so denominated from its shape, which was different from the usual custom at the time it was formed, as then all pieces of ornamental water were made straight. It was undertaken by command of Caroline, Queen Consort to George the Second, in 1730; a string of ponds and gravel pits being drained and converted into this piece of water, at an expense to the country of £6000.

It was formerly supplied by a little rivulet called Bays Water, one branch of which arose at Kensall Green, in the Harrow Road, another about Kilburn Wells, a third near Fortune Green, a fourth at West End, Hampstead, and a fifth in Belsize Park, behind Primrose Hill. These all united, and passing under

the Paddington Canal, by an arch near Westbourne Green, went through some tea gardens at Bayswater, so called from the name of the above rivulet, thence the stream passed partly under a bridge across the Uxbridge Road, and entered the upper end of the Serpentine River, in Kensington Gardens. Sixty years ago, and I do not know how recently, young anglers found amusement at these tea gardens in catching roach, paying sixpence for the afternoon, or nothing if they had tea there. I am informed that this brook, having become exceedingly filthy, through the large increase of buildings in that locality, had been arched over by the Commissioners of Sewers, and its course diverted to a large sewer leading to the Thames. Where the supply of water now comes from to preserve that of the Serpentine in anything like a healthy state, I do not know; but any super-abundance of the water from the Serpentine, passes under some of the houses at Knightsbridge, into the Ranelagh common sewer, and thence to the Thames, close to which a water company drew their supplies in 1827; a shameful proceeding, properly exposed, and I think now prevented by the Acts of the legislature; the guilty parties, directors and officers, ought to have been condemned to have no other beverage than that taken from the very spot which they chose as fit for their customers. In former pages I have spoken of the fishing in this water.

Dagenham Breach was caused by the breaking of the sea bank, through a very high tide and a heavy storm of wind, on or about 1703. One hundred and twenty acres of land were swept away, the whole marshes drowned, and not drained till 1714. Parliament made a grant of £40,000 or £45,000; I believe 12th Anne, cap. 17, refers to this grant. Mr. Perry undertook to repair the sea bank, and to do what was required, for the above sum; but it was said he lost £3,000 by the undertaking. At the spot where the breach took place were found exposed to view the trunks of many large trees, that must have been buried for ages. This gulf could not be drained in consequence of its immense depth, and, as it is thought, the bottom being a quicksand, which has led to the belief, amongst some persons, that it is bottomless. There are large bream here in abundance, roach, perch, pike, carp, tench, and eels. When Mr. Fry, the banker, had this water, at considerable expense, he had cod, soles, and turbot, placed in it alive, but they were never seen afterwards, the most probable conclusion is that they died, and that the other fish devoured their remains. It appears, from measurement on a large map, to be half a mile long, and at its widest part three-quarters of a furlong broad.

I never fished in this water, but several persons

who have done so, report that the fish caught there must be cooked as soon as taken; and from the description given, I imagine that they contain too much albumen in their composition, therefore immersing them in boiling lard, or oil would be the best means of converting them into wholesome food; and those fish that are usually boiled, the water should be boiling when they are put in, with a good fire under the kettle. (See observations on cooking fish.)

Formerly, several gentlemen, some from London, others from the neighbourhood, had boats on this water for the purpose of angling; and the resort of company to it, was of great service to the village of Dagenham.

There is great depth of water close to the edge, therefore anglers should be cautious not to go too near, unless they are good swimmers; an example of the most providential escape of Mr. James Briscoe, of Barking, is recorded in the "Morning Post," of September 27th, 1841. He was trolling for pike, and hooked a large fish, which soon ran all the line off his winch, and had not the fish taken a course parallel with the shore of the Gulf he must have broken the tackle. Mr. B. kept him in play, but unfortunately getting too near the water, he fell in, where the water was twenty feet deep, and not being able to swim, he cried loudly for help, which attracted

the notice of some men who were at work in the marshes, and with considerable difficulty Mr. B. was rescued. Seeing the rod moving about on the water, one of the men who could swim well, stripped, swam after, and seized the rod; after many struggles, the fish was landed and proved to be a pike which weighed sixteen pounds and a half, and measured nearly three feet in length.

I wrote to the keeper of this water, relative to the terms for angling therein, and on the 31st of August, 1854, received a reply from him (W. Clapham) that by paying one shilling for a day, the person may take what fish he can. It appears by the map that, by railway, stopping at the Rainham station, the angler could reach the water in a walk of about two miles; or one mile one furlong to the smallest end of the gulf; and one mile five furlongs to the Breach House, both from the village of Dagenham.

In May, 1835, I was told by an experienced angler, that there are plenty of rudd in this water, and very good sport may be had by throwing an artificial fly for them; I do not know if this be so. Rudd are found in the Rhine; in the Lakes of Holderness, in Yorkshire; in those not far from Lincoln; the river Yare in Norfolk, which runs to Norwich, and to the sea near Yarmouth; and the river Charwell, which passes near Banbury, Oxfordshire. The true rudd is

considered one of the first class of fishes; it is broader than a carp, with scales as large and thicker than a bream, usually twelve to fourteen inches long, of a dusky yellow colour; the largest are about two pounds. They bite freely, feeding near the top of the water; baits, red worms and flies.

At Godstone, in Surrey, according to Salter, there is a pond or ponds, containing abundance of carp, from three to five pounds each; he says, at the White Hart Inn, there, all particulars can be learned—the price charged is thirteen pence per pound for all you catch. He relates that an angler, in one day, took sixty-six pounds and a half of these fish, for which he had to pay three pounds twelve shillings!

Six to eight dozen of trout have been taken in an afternoon, in a water belonging (in 1800) to Mr. Brown, four or five miles above Dorchester.

Durham, Stockton, &c., salmon and trout.—In the river Wear, and its tributaries, salmon fishing is to cease on the 16th of September, and recommence the 12th of February. This was settled at Quarter Sessions, in October, 1849, through the interference of the Anglers' Association.

Hampshire, about Christchurch, salmon and trout. Indeed there are abundance of the latter fish in almost every river in this county; particularly the Test, at Whitchurch, Long Parish, Chilbolton, and Stock-

bridge; above Redbridge, there are salmon, salmon-trout, and mullet. In the Itchen, which was formerly a most excellent trout stream, these fish are comparatively scarce; but the grayling are abundant.

Herefordshire, in the Wye and the Lug. It is said the salmon are always good, but this, I believe, is not true; they have their proper seasons as well as trout. In the Teme, near Presteign, I am informed by a resident of the highest respectability, is uncommon fine angling for trout in its season; and about the second week in September, for large graylings.

Hertfordshire has most of its rivers well stocked with fish, particularly trout. Mr. L. and myself went, on one occasion, to Watford, and by throwing a very long line, we caught four brace of trout; I have been there several times since, but the sport is uncertain.

Kent.—At all the Crays there are trout; also at Bexley, Crayford, and Dartford; but they are mostly white trout. A famous fly-fishing match took place in the waters of Lullingstone Castle, some years ago, between two gentlemen named Pocknell and D'Almaine, both of the Stock Exchange, in consequence of a bet between a miller (A No. 1) of Dartford and a sporting gentleman of Blackheath; which was decided in favour of D'Almaine, who had caught thirty-six brace and a half, whereas Pocknell had only caught

thirty-five brace. The then Sir Thomas Dyke behaved most hospitably and kindly to these gentlemen, and was much interested in the result of the match, which took place a short time previous to the decease of the baronet; therefore, I presume, must have been about 1846.

Virginia Water, the most beautiful lake near London, is only a short distance from Windsor. It is well stocked with fish; and his Majesty George the Fourth used often to amuse himself there, with angling. This water has one source, from a spring in a large pond in Cranbourn Wood, near Ascot Heath, which supplies four or five ponds in Sunning Hill Park. From Sunning Hill wells a stream runs, which joins that from Sunning Hill Park, about Bucket Hill; from thence it expands, and runs through Windsor Great Park, into the east end of Virginia Water. In Windsor Great Park, near the Lodge, is a large lake, which, after forming three or four long ponds, also passes into Virginia Water, on its northern side, near where the waters from Sunning Hill enter. To the west of the Great Lodge is a long pond, communicating with one much larger, from whence there is a narrow cut to the extreme north point of the other end of Virginia Water. The superfluity of the whole falls over a cascade, and passes under the Bagshot Road, this side the twenty-

one mile stone, and runs into the Trumps' Mill River, to which mill it assists in giving a head of water. Many years ago, the cascade gave way, and considerable damage was done in the neighbourhood. An immense quantity of fish were taken in all the brooks with which Trumps' Mill River communicates; one runs by the upper part of Chertsey town, into the Thames; another branch runs to Woburn Park, and there dividing this park from Ham Haw, one part falls into the Thames, in Chertsey mead; the other continuation, called the *Bourne Brook* (before mentioned), passes into the Wey navigation, by Weybridge Bridge, and so into the Thames, at Thames Lock.

How permission to angle in Virginia Water can be obtained, or whether obtainable at all, I am unable to say.

There are many ponds in the neighbourhood of London, but having never taken the trouble to go to them, I can give no information. Salter, however, in one of his works on angling, to the best of my recollection, gives full information on that head.

As connected with pond fishing, I will mention a ludicrous incident:—I passed over Clapham Common, on my way to dine with my friend, Mr. L., who then lived near that locality; and having observed, as I drove past, on the surface of the water of

a pond, with an island in it, innumerable gnats, and some small fish rising at them; I mentioned it to him, and in the evening we walked to the pond; he taking with him a fly-rod, &c. He put on a small fly, but could not catch one to satisfy our curiosity as to what fish they were. Two or three young gentlemen, the water being low, had jumped across to the island; they had with them a fine large brown water-dog, who was swimming about, snapping at the gnats; as he approached nearly within the length of Mr. L.'s line, I said, "Perhaps the dog would like the fly." Mr. L. replied, "I'll try him!" and suiting the action to the word, dropped the fly before the dog; swift as a trout could have done, he took the fly, and was hooked; the poor animal feeling the hook, swam rapidly to the shore; away went the line off the winch, the dog ran out upon the common, and my friend following him at his utmost speed, who being stout, and having had the advantage of a good dinner, found it no easy task to run, and jump over brake, furze, and briar, playing the dog, yet laughing most heartily, though anxious to save his excellent tackle. The young gentlemen, myself, and several other persons were unable to speak for laughing. At length I begged the owners of the dog to call him, or the hook might injure the animal; the dog, thoroughly frightened at seeing a

person following him about, with what must have appeared to him a long whip, and feeling something pulling at his mouth, approached his masters, trembling all over; as soon as the line was slackened, the fly, which had merely stuck in the lip, dropped out, and no injury was done to either rod, line, or dog.

About Southgate there are many rivulets; one near East Barnet, called Salmon Brook! Why, I know not, as that fish could never have visited it.

About six miles and a half on the Edgware Road, at a place called the *Hyde*, is a piece of water, at the Welsh Harp, where, I have been told, there is very good pond angling, by paying a moderate sum.

I was once induced, a very few years ago, to go by railway to Stratford, and walk thence to a hamlet called *Philibrook*, near two miles to the left from the station, towards Leyton, where, in a large pond, called *Rockholts Point*, I was informed I should find plenty of fish; but the person who obtained the permission as a favour, it being private property, could not tell me of what species they were. I therefore burthened myself with a long rod, artificial minnows, gudgeons, worms, and paste, and went to the water, which was, I think, nearly or quite a furlong and a half, or more, long—probably forty yards wide, about two feet deep, free of weeds, and so clear that I could see all over it—but no fish of any kind appeared.

However, I put my rod together, baited my hook, and threw in some pellets of paste—but they remained untouched. Presently three or four genteel boys approached me; and one, respectfully, asked if I had had any sport? I replied in the negative; when judge of the disappointment of an angler, not *very* fond of bottom fishing, even in a river, after being a fly-fisher, and still less of it in a pond, to be told,—"I do not think you will have any sport, Sir; for the pond was netted, and every fish that could be caught was taken out, about three or four days ago; and here are the places where the nets were dragged on shore," shewing me evident marks on the bank. I therefore put up my tackle, returned home, and never since have wetted a line in a pond.

There were in ancient times, as chronicles tell, "abundance of choice fish in this pond, also in a pond above, with an island in it." These waters belonged to, and formed part of the ornaments attached to a large house and grounds adjoining, whose owners lived in great splendour, had boats on the two ponds, and with music and fireworks, &c., on the island, and dancing on the lawns, enlivened the whole neighbourhood. Now the island pond is nearly dried up, serving only as a passage for the water to the large pond from a rivulet, which is formed by a spring in a pond above Buryfield Farm, about a mile to the north,

by the side of the road leading from Leyton to Assembly Row. In the island pond there were, and probably are, a great quantity of mussels of an immense size; and in a pond near, the neighbours say, was found an oyster alive! The surplus of water from the great pond runs into a convenient receptacle, on the right side of the road to Leyton, which supplies the neighbourhood with water; thence the superabundance passes across the road, under an arch, to an immense water-cress bed, and thence into a branch of the River Lea. It is probable there are fine eels in these ponds.

Curious circumstances occur to anglers, or are seen by them. Dr. Gillespie relates, that he saw a swallow from above, and a trout from below, both pounce upon the same June fly; down came the swallow, and up came the open mouth of the trout, into which, in pursuit of his prey, the swallow pitched his head: the struggle was not long, but severe; the swallow was once or twice nearly immersed in the water, wings and all, before he disentangled himself from the sharp teeth of the trout. Both bird and fish must have been much frightened at the encounter. (Scrope's "Tweed.")

A gentleman, fishing with live May-flies in the Wye, and having one on his hook, went into an inn on the roadside, leaving his rod on the outside; a

fine dunghill cock took a fancy to the fly, and became hooked in the soft part of his beak; feeling the hook, the cock moved from the spot; in doing so he pulled the rod down, with which he was running away in great alarm; the angler, seeing his rod departing, gave chase, regained the hold of his rod, when the cock mounted into the air, and was with great difficulty brought down and secured.

At Hampton Ait, on which ducks are generally kept, I have seen them take a gudgeon with the hooks which had been left outside by some angler, who had been spinning or trolling; in most cases the duck was killed by it, and often the tackle much injured, through the carelessness of the angler.

A boy named Donaldson, belonging to Coldstream, while fishing very lately for trout, in the Chapel stream, below Tweed Mill, with a worm as a bait, caught a mussel four inches long, and two broad, which was found to contain no less than forty fine pearls of different sizes; some of the pearls are thought to be worth ten shillings each. The day before, the same boy hooked and landed a fine clean salmon, eight pounds weight, with trout tackle.—"Border Advertiser."

Oppian speaks of the nacre; this shell fish is a species of mussel, and furnishes mother-of-pearl. A little fish of the crab genus resides within the shell

of the nacre, and the above Greek poet treats the connexion as a sort of partnership for obtaining food. These mussels were called by the Greeks pinnæ, and the small fish that lived in the same domicile pinnatores and pinnophylax. The nacre, to prevent itself from being driven about by the motion of the sea, spins a quantity of long silken fibres, which it attaches to rocks, or any substance, even the sand. These fish are about a foot long, but have sometimes attained the length of two feet; they were formerly much sought after, in order to obtain the silky fibres, which being spun into threads, were manufactured into a variety of articles of dress. The common mussel sends out a number of filaments, and by the observations of Reaumur, those filaments are for the same purpose of fixing itself to some solid substance. On opening mussels a little bunch of green fibres are discovered, these are the parts produced by the fish, whereby it keeps itself upright; and these fibres, if not extracted before the fish be eaten, are very dangerous to the health, because the other portions of the fish easily digest, leaving a mass of these fibrous substances, being indigestible, to accumulate together by the motion of the stomach, producing in a strong constitution considerable disturbance, and in a person of very delicate habit of body, dangerous and even fatal consequences. For some of this information I am

obliged to the "Penny Cyclopædia," the "Penny Magazine," the researches of a friend visiting the British Museum, and my own references to Oppian's "Halieuticks."

At *Uxbridge*, by putting up at the Crown and Cushion, or at the White Horse, and taking your refreshment there, you could, a few years ago, angle in the Colne; but you had to pay for the trout you took away, fish ten to twelve inches, two shillings a pound; twelve to eighteen inches, half-a-crown a pound.

About two miles from Uxbridge is a small village, called Yewsly, and I am told that the landlord of the "TROUT" there can give his customers permission to angle. I think this must be the village, a little to the right of the West Drayton Station, where there is a very comfortable house bearing that sign, with good accommodation and moderate charges; the angler pays one shilling for his day's angling. I am told there is good angling at the place you are taken to, some little distance across the railroad, if the weather be appropriate; but I was not fortunate in having a favourable day, and I have not been there since.

THE RIVER BRENT runs at the back of the Coach and Horses, at Hanwell, and there are, it is said, very deep holes, containing large bream.

The River Mole has innumerable sources, derived from small springs, which form rivulets, that by accumulation swell into a river. One of these rivulets rises on Colley Moor, not far from Cole Harbour, and meandering in its course, swells into a large pond, near the Evelyn Arms, at Wotton, which pond formerly belonged to the monks of Chertsey Abbey, and is believed to have been one of their reservoirs for fish, probably for carp, because that fish was, it is believed, introduced into England not more than fifty years before the suppression of this Abbey, and being considered a luxury, there can be little doubt but these monks took care to enjoy it. This pond is above a mile in length, but full of weeds; it communicates with another large pond, by a continuation of the rivulet, which last pond forms a mill-head for Wescot Mill. All the different little streams I mention unite into a considerable river, and approach Boxhill, where it sinks into clefts of chalk, like as through a sieve; this river was formerly called the River Swallow. In 1670, by the highway side, a great quantity of earth fell down from the side of the hill, and discovered a pit thirty feet deep, and at the bottom the water could be seen running. On the other side of Boxhill, next to Leatherhead, the river appears to spring out of the ground, in a greater or less quantity, according to the wetness or dryness of the season.

A very little rain makes the water of this river quite thick. Down the stream, as low as Cobham, there are sometimes trout; lower down at Esher, as I have before observed, there are plenty of perch. The river Mole enters the Thames nearly opposite Hampton Court Palace.

The Hog's Mill River has many sources; one chief branch rises near Epsom, the other forms a large, clear, and deep pool at the entrance of the village of Ewel; they unite somewhere about Ewel marsh; this stream, though small, has several mills upon it, and contains, I have been informed, trout of considerable size; but it is difficult to obtain permission to angle.

This river passes under the South Western Railway, a little beyond the Malden station, where it appears so insignificant, that any boy could jump across; it descends into the Thames, under a bridge, as you leave Kingston, on the old Portsmouth road.

The Old River Wey has deep holes, and by the bridge at Weybridge, is very wide, and continues so for a considerable distance; it then contracts, but expands again at Byfleet; it contains an immense quantity, and every variety of well-fed fish, except trout.

In the River Chelmer, near the mills at Chelmsford, I was informed, when there in 1830, that perch

of two pounds weight were often taken, and remarkably fine gudgeons.

In "Bell's Life in London," October, 1842, we are told "that the River Roden runs through the grounds of the Earl of Mornington;" (I presume at Wanstead;) "there is a large ornamental water; apply for leave to Mr. Boyd, who rents the manor. Fish opposite the grotto for jack, with a small gudgeon; this river contains jack, carp, perch, and eels. To angle at the cascade, or in the moat surrounding the garden-wall of C. Mills, Esq., apply to Webb, his gamekeper;" (this appears to be above Woodford;) "if at the Weir, to W. W. Maitland, Esq."

This river runs by Ongar, Aibridge, and Loughton to Woodford, and has pike, perch, carp, tench, roach, chub, and eels. It falls into the Thames below Barking, forming what is called Barking Creek.

The River Cray contains trout, the flesh of which is white, when cut. I was informed, that in the mill tail of Hall Place Mills there are sometimes salmon trout; and I was invited to angle there, but could not spare the time then, and now the family have left those mills.

In the River Darent there was formerly great abundance of trout. What there may be now, I cannot say; but I believe the proprietors on its banks are very indulgent to gentlemanly and sportsmanlike anglers.

The River Wandle has, or formerly had, several different species of trout. There was at Hackbridge a small kind, which never grew to a large size; they were very numerous, and rose at any small fly. The trout in the whole of the Croydon branch are dark in colour, the flesh white, and not well flavoured; whilst those from the other, the Carshalton branch, are larger in size, thicker, and broader in proportion to length, beautiful in appearance, seeming as if covered with a thick coat of yellow varnish, show great sport when hooked; their flesh is red, and I was told by a distinguished personage, to whom I had the honour of presenting a leash, weighing above seven pounds, that he had seen and tasted trout in every part of England, and in many places on the continent, but never saw any so handsome, or tasted any so good before. I certainly adopted the means to keep them good. I *killed* them as soon as taken, and packed them in nettles. The same eulogy was passed on these fish by the late Duke of Wellington, to whom I had the pleasure of presenting some of these fish, on several of the anniversaries of his birth.

I have always found the proprietors of the private waters on this river, with one or two exceptions, very kindly disposed to anglers of respectability. One of the exceptions was Mr. William Gee, who resided at Beddington Park, as the steward of his brother,

and ostensibly the owner of it. An anecdote is told, and I believe it of him, that Mr. Scott, when Attorney-General, wrote a note to Mr. Gee :—"Mr. Attorney-General presents his compliments to Mr. Gee, and will feel obliged to Mr. Gee, if he will give Mr. Attorney-General a day's fishing in Beddington Park." To which the following answer was returned : "Mr. Gee's compliments to Mr. Attorney-General, and if he was Lord Chancellor, he would not give him a day's fishing in Beddington Park."

It is singular that this, and other immense property formerly belonging to the monks, was obtained by a courtier from Henry VIII. ; that this courtier then was detected in conspiring with Cardinal Pole to re-establish the Catholic religion, was punished by decapitation, and forfeiture of his estates. His son proved himself to Mary so good a Catholic, who had not only lost his father by that father's attachment to the "*true* religion," but also had been reduced to beggary in consequence, that she granted to him above thirty manors in Surrey, and other counties, together with advowsons, &c., a copy of which grant I have. When Elizabeth became queen, he professed himself to her a *most zealous protestant*, and by his courtly, insinuating manners, and good *personal* appearance, induced the *virgin* queen to honour him with a visit at Beddington, during a day or two at a

time. When James came to the throne, this man shuffled off, and finally and totally evaded the payment of a fee-farm rent for part of his estate. Having no heirs, he contrived to get his nephew into the property at his death; the line failed again in the person of a descendant of this nephew, who left it by will to many reversioners in succession, provided that the park, gardens, house, furniture, paintings, plate, &c., should be preserved as heir looms for ever; the second of these reversioners was the brother of William Gee, whose wife managed to induce the next reversioner, but who was led to believe he was very distant, to sell his birthright for, comparatively, a mess of pottage. Mrs. W. Gee obtained a will in her favour, from her brother-in-law, who devised to her all his real and personal estate, under which, amongst other things, she took this park, &c.; and it would have been a curious coincidence if the crown had asserted a right to the property (in consequence of failure of heirs male, to whom it was limited) and the subject had gone before John Scott, Lord High Chancellor, formerly Mr. Attorney-General, to whom Gee would not give a day's fishing.

Mrs. Gee died, and left this park and estate to an alien in blood, and name. What has become of the plate, paintings, and other heir-looms I do not know, but suppose they must be where they ought to be.

By law I learn, they are not liable to the debts of the tenant for life.

In the canal whose end faces Beddington House, I have seen trout as long as a small hedge stake, and almost as thin; this arises from the want of more water running through it, which could be easily effected, and would bring more food for the half-starved fish; another evil is, the quantity of decaying vegetable matter constantly falling into it from the leaves of the surrounding trees, (which should be carefully swept up, and burned); every alternate tree ought to be cut down, the fish taken out of the canal, and preserved, whilst it was emptied and completely cleansed, then there might be trout in it as large as in the upper pool at Carshalton; but they would never be as good, being altogether a different species of fish.

I once caught a trout, just by the arch which lets the water from the upper to the lower pool in Carshalton town, by letting down a hook baited with a worm. I had great difficulty in keeping him out of the arch, but landed him where horses and carriages used to pass through the pool, and he weighed six pounds. And I saw one at Mr. Curtis's, Paper-maker, lower down that branch of the river, in a sort of pound, where he was constantly fed, and weighed twelve pounds. It was intended that he

should grace the dinner table on the day the son attained his majority.

The regular season for angling with a fly, and that is the only bait allowed in the private waters of the Wandle, is, from the first of May to the fifteenth of September; the same as in the Hampshire and other trout rivers. And, upon one card of admission sent to me, for the then Mr. Ansell's Printing Ground, it is requested, that no fish be killed under half a pound weight. Now this I consider is too small; and it would be better to permit none to be taken under the size directed by 1 Eliz., cap. 17, viz. not less than eight inches from the eye to the end of the flesh, in the middle of the tail; and a well-fed fish of that size will weigh three quarters of a pound.

Some of the trout in this river come into season the latter end of March or the beginning of April; the late Sir Anthony Carlisle shewed me two or three brace, which he had then, the middle of March, taken in Mr. Ansell's water, and they appeared, to the eye, in very good condition.

Trout fishing in Wales, Cumberland, and Westmoreland, begins two months before it does in Kent, Surrey, Middlesex, and Hampshire; in these latter four counties, the season is from the first of May to the first of September, in some streams, and to the

tenth or fifteenth, in others. In the Test to the last-mentioned day.

Trout are taken in the Thames in March; but they are valueless as food, and no person ought to be allowed, either with fly, or spinning a gudgeon, dace, or bleak, to take them until the 1st of May; and it is illegal to take them after the 13th of September. In the Tweed, the salmon fishing ends the 15th, and in the Severn, the 17th of September.

In the "Globe" of 12th Sept., 1854, it is stated under the head "Severn fish, Mr. Lloyd took between Cound lane and Coppice head, last week, two salmon, one six pounds, and the other twenty-two pounds, in prime condition; nine and a half brace of perch; four and a half brace of trout; and six and a half brace of greyling."—Copied from the "Shrewsbury Chronicle."

Near *Shrewsbury*, Ludlow, Cundover, and Wem, there are salmon, salmon trout, trout, grayling, salmon fry, gravlings, or gravel last springs, or sampsons; these last being young salmon, should not be taken under a heavy penalty, being, no doubt, identical with the skegger of the Thames, and the scegger of the Mersey. In the Clun Water there are some barren trout, which are in season all the year, according to Taylor. Have these barren trout ever been examined by a competent naturalist, as to their sexual character?

Somersetshire.—At Glastonbury, in the Brent, where it forms a large lake, the Yeovil, the Brue, the Parrat, the Tone, the Axe, and many other rivulets, there are trout, particularly near Ilchester, Frome, Pethorton, Langport, Taunton, Dunster, also at Mitford, three or four miles above Bath. In most parts of this county the trout are small, but plentiful, and of good flavour; but at Milton, near Bruton, the stream is slow, and the mode of fishing will not suit a fly-fisher, as I before mentioned, being float-fishing; and the fish are dark, and not pleasant as food.

Surrey.—The Wandle, the Mole, and the Thames, contain trout in abundance.

Yorkshire.—Its rivers and waters are well stocked with fish. In the East Riding, a small but rapid stream, called Duffield, or Drielfid Beck, has trout, few less than two pounds, and frequently they are taken five to six pounds each. About six miles from Sheffield, there are abundance of trout. I have never had the advantage of angling in North, or South Wales; but I am assured by several of my friends, natives of that part of the kingdom, that a trout angler cannot fail of finding sport in every stream of that principality. A few observations on the fish of some of its waters may be acceptable:—

The Dee, in Merionethshire, passes through

Pemble Mere; and it is a curious fact, that though the Dee abounds with salmon, and the lake with a much-esteemed fish called guiniad, yet no salmon are taken in the lake, nor any guiniad in the river. A description of this rare fish, and its habits, from an old author, may not prove uninteresting. It is believed to be the *Ferra* of Rondelatius; the *Albula Salmoni similis* of Willoughby; called by the Welsh, from the whiteness of its body, guiniad, signifying something like whiting in English. Its shape is not much unlike that of a salmon; length twelve or thirteen inches; back of a dusky colour, belly white; the scales of a middle size; upper jaw a little longer than the lower, the mouth like that of a herring. It generally lies at the bottom, amongst water gladiol; a plant peculiar to these mountain lakes. It is in season in summer; the flesh is white, the taste like that of trout; it is esteemed because it is a rarity. It is also found in Lake Leman, near Geneva, among the Alps. Another old author says, they are found in the same lakes and waters as the gilt char; also in some northern rivers. They spawn in December, previous to which they force themselves up the most rapid streams, advancing in two ranges and forming in front an acute angle, led by a single fish. This author says their flesh is insipid, and must be eaten as soon as caught; same baits as for trout. From

this it may be inferred, that the guiniad does not take a bait in the river, or the salmon in the lake; and probably this may account for the vulgar error of the river Dee passing through the lake, without any admixture of the two waters. But it is evident that the water of the river is not inimical to them, but the contrary, as they go up the river to spawn. The difference of opinion, as to their flavour, may be accounted for by one person having anticipated tasting a fish of superlative delicacy, and finding that, like most anticipations of pleasure in this world, it was not carried out by the reality. Whereas, another person tastes them as being a rarity, having fallen in his way, without thinking previously about them; and to him they are palatable and pleasant.

Brecknockshire.—About the middle of the county, I think, near Brecknock, there is a large piece of water, which was formerly, and may be now, so overstocked, that people about there say, there are two-thirds water, and one-third fish; but of what species, I am ignorant; they may be worthless Crucian carp, or the useless hybrid that swarm in the Serpentine.

Carmarthenshire.—In the Gwili, down to Abergwilly, and thence to its junction with the Towy, there is, I am informed, plenty of trout; and in the latter river there are fish of the trout genus, called

sewen or seuen. Hofland thinks these are the sea trout, or whitling of Scotland; and the white trout of England and Ireland. They are taken with a gaudy fly; weight from two to six pounds. He says they are more round and thicker than the salmon; and is of opinion, that the Fordwich trout, of the Stour, near Canterbury, are the same species; but these latter trout seldom, if indeed ever, it is said, take a bait.

In June, 1823, I arrived with a friend, late one Sunday evening, at the chief inn of Wells by the Sea, Norfolk; it was a damp, chilly evening, we had been travelling all day through the most wild part of the county; so much so, indeed was it, that on a heath or common, where there were many tracks, our post-boy stopped the chaise, and absolutely mounted its roof to look out for a steeple; so it might be really and truly said we were *steeple chasing*. In such a part of the county, as might naturally be supposed, we had obtained only very meagre refreshment; and on arriving at our hostelry, we enquired what we could have for supper. Amongst other things, we were told, they had poultry, and some sea trout, *said* to be *just caught*, which were brought to us; they looked fresh, and like small salmon; they were cooked and brought to table; but on tasting, we simultaneously sent away our plates—for of all the

specimens of the finny tribe I ever tasted, these were the very worst; if herrings, sprats, and bad trout had been mixed to compose them, they could not have been more disgusting.

I enquired how they were caught, and found it was by a long net, to each end of which a horse with a rider was attached. In some parts near the beach, where the sand was low, near the shore, the tide flowed in round it more rapidly than on the high bank further out, and the fish came with the water into that low part. When the persons accustomed to the sport saw it was the proper time, the horses separated, one on each side of the flowing tide, with the net swiftly sweeping the water of all the fish that had come in, the horses being put to a gallop. The reason was, that these sands are something like those of the Goodwin, and those on the Somersetshire side of the Bristol Channel, and many other places; they become a species of quicksand as soon as the tide flows.

Referring again to the river Wandle, myself and several of my friends used to go, in the middle of summer, in the afternoon, to this river, have the evening fishing till late, go to the Duke's Head, Wallington, where we always found, by sending a letter beforehand, a comfortable supper and bed; and could leave our rod and line, with the fly on which we

intended to use in the morning, in a large room, and let ourselves out at any hour we pleased; as there were several parts of the river which, to be successful, must be fished before, or as soon as break of day. I had acquired a habit of always awaking at any hour I pleased. I was to have accompanied a friend of mine one afternoon, but was prevented by some cause which I forget, and he went by himself. The following morning was cloudy, yet there was a moon, not visible. He awoke, thought it was the day breaking, could not see the hour by his watch, hurried on his clothes, and walked quickly up to a piece of water above Beddington Park. As he was going round Beddington churchyard wall, he heard a slight rustling noise, and at the same moment saw something moving, of a light colour, upon the top of a tombstone; just then the church clock struck *one*, a horrible unearthly scream sounded from the spot where the moving figure was, and away flew the screamer—a screech owl! My friend had to walk about for an hour and a-half, before there was a chance for him to use his fly with advantage, as he had shut himself out of his inn by the spring lock. Some timid persons in that neighbourhood have believed this churchyard to be haunted; but my friend most certainly saw the substantial ghost which had frightened many.

About half way between Chertsey Bridge and Laleham, in the Thames, there is a spot called the Rocks; they appear as if large masses of the bank had been excavated, and fallen over into very deep water, some of the irregular parts being, when the water is low, only a foot, or even less, under the surface, whilst around probably the water is from fifteen to twenty feet deep. With a long light rod, a fresh wind at the angler's back, a long blow line, and the hook baited with a natural stone or other fly, or a grasshopper, often from the Surrey side, many large chub were taken; but of late years that part called Laleham borough is enclosed, and I do not know if the Thames can now be reached in that part, at least certainly not without permission of the owner of the land.

My family had lodgings at Chertsey in the autumn of 1826, and I went on a Saturday, and returned on the Monday evening, or Tuesday morning. I had taken an acquaintance with me on one occasion, and on the Sunday night I told him that the fisherman whom I employed was going with me to net a piece of backwater, where we expected to find some pike. At six o'clock the next morning we went to the scene of action. I gave my visitor the cork line to pay over the side of the punt, and I did the same with the lead line, whilst the fisherman made the circuit

with the boat: my companion begged me to stop a moment, till he put on his gloves, and, to the astonishment of the fisherman and myself, he put on a pair of kid gloves, but little soiled; they soon, however, became too dirty ever to be cleaned, so he left them in the punt; and when we had finished our sport, went to the inn, washed his hands, had some rum or brandy and milk, put on a clean pair of kid gloves to walk home to breakfast. I had the pleasure of taking with me a leash of good pike, or rather jack, for neither of them attained four pounds, therefore were not pike. The fisherman, who did not know the gentleman's name, used often to inquire after him, as the gentleman who wore gloves when he went netting; and we often laughed at the occurrence, till the death of the poor young man stayed any mirthful recollections of him.

The navigation of the Thames is, as I before observed, most materially altered for the better, as to the traffic, and, I presume, also for the increase of the City funds, but to the complete destruction of the Thames fishery for salmon, by the ill-judged formation of the weirs. Formerly, within my recollection, there was no lock before you reached Boulter's Lock, near Taplow, about fifty-four miles by water from London Bridge; and in very dry summers the passage of barges, particularly those called west country

barges, which were of double the tonnage of the others, was very difficult; I have seen eighteen horses or more employed to draw one up against the then rapid stream. The number of locks and weirs since then erected by the City are five or six; but what the tolls taken by the corporation amount to, is probably only known to their own officers.

It is not much above, if so much as an hundred years ago, since men were employed to tow barges up the river Thames; amongst the cosmoramic views at the Polytechnic, there used to be one of Windsor Castle, with several men towing a barge. How they managed in flood time I cannot imagine; the barges frequently could not work before the erection of the locks; sometimes there was too much water, and sometimes too little; during floods, many horses and some of their drivers were occasionally drowned; and in summer barges were often aground, and could not move before a quantity of water, which was penned back at Boulter's Lock, was suddenly let down, and this was called a "*flash.*" It always came down of a Sunday afternoon, and sometimes also on a Thursday, when the craft that were aground floated, and all was bustle and hurry to get down or up the river. I have, when a boy, walked down to Sunbury, on purpose to have a ride home in the barge belonging to a relative: the burthen of the barge was stated as

being forty-five tons, and with only thirty-five tons in, and ten horses to draw the barge, I have felt her grate on the gravel in going over the site of Coway stakes, just above Walton Bridge, where it is asserted Julius Cæsar crossed the Thames, when he left his camp on St. George's hills, the trenches of which were quite visible sixty or seventy years ago.

Dr. Battie was the person who caused horses to be used instead of men, to tow barges on the Thames, which so offended the men who were thus employed, that they attempted once to throw him over Marlow Bridge; but he placed his wig wrong side in front, and acted Punch to them so irresistibly and humorously, that they let him escape; after which, he always carried pistols. He lost £1,500 by the speculation.

A horse can draw horizontally, 770lbs; a man can draw 110lbs.; therefore, it requires seven men to produce a tractile power equal to one horse; now, as that time fifteen to twenty horses were necessary to tow a large barge up against the stream then existing, it would take from 105 to 140 men to tow a barge up, and then they could only work whilst the river was confined within its banks.

He cured a young gentleman of quinsey by acting Punch in the same way, which gave rise to the following lines:—

"And he who lately in a learned freak,
Poached every lexicon, and published Greek,
Still madly emulous of vulgar praise,
From Punch's forehead wrings the dirty bays."*

William Battie, M.D., born 1704. Intended for the law, settled at Uxbridge, in a medical capacity. After, was physician to St. Luke's Hospital, which he resigned in 1764: died, in June, 1776. Buried, Kingston-on-Thames.—"Nugæ Chirurgicæ." By W. Wadd, F.R.C.S.L. Nichols and Son, 25, Parliament Street, 1824.

Towage on the Thames by horses is very expensive; and I suggested the idea, about ten years ago, of towing two or more barges at once, by means of steam; but for this purpose, I was aware that common steam tugs would be objectionable, as the great disturbance of the water by the paddle wheels on their sides, would injure the banks in the upper portions of the river, and I was informed that though the screw had great propelling power, its tractile power was found insufficient. I therefore made drawings of a steam tug with a large wheel in the centre, and made a model of a vessel of the description, with great power, which would answer the purpose, without any lateral wash affecting the banks, whereby two or more barges could be towed up the river with greater celerity, and at less than half the expense. I

* Professional Anecdotes. Knight and Lacey, 1825.

entered a caveat preparatory to taking out a patent; but, owing to my professional engagements, I did not proceed with it. I think the plan would answer well for the Thames, and if modified in point of size, for canals also.

Since the construction of this model, a company started steam tugs on the Thames with, as it was said, improved paddles at the sides; but they occasioned very great damage to the banks above Teddington, and from that cause, I believe, this method of drawing barges against the stream has been some time discontinued.

I said that the construction of the weirs, as directed by the City of London, were ill-judged; a legal friend tells me that by 17th Richard II., cap. 9, the justices of the peace are to make diligent search, and see that the weirs of rivers are not very straight for the destruction of fry and brood, but after the old assize, used and accustomed; so that, these weirs in the Thames are *illegal*, as well as *ill-judged*.

At the Horse and Groom, Lea Bridge, there were some of the best roach anglers I ever met with; for goodness of tackle, skill, patience, and respectability, they had no superiors. The accommodation was excellent; the place quiet and retired; and I have no doubt, from what I have heard, that it still preserves the character.

Ground baiting was practised more than 1650 years ago. Oppian describes that the paste was made of odorous cheese and flour; and being divided into pills, the fishermen threw a shower of them in, to attract the fish; so that fish must have had a *penchant* for cheese, from very early periods of the world. Another ground bait from the same author is, goat's flesh and fat, incorporated with flour, and scattered into the water in small pieces, for one kind of fish, the scaro. (See Willoughby.)

I was recently told by a very old angler, of proverbial veracity, and elevated rank in society, that a small piece of clean-scraped rind of strong cheese put on the hook whereon the fly is dressed, will attract chub very much; this also proves how acute must be the sense of smell in fish. Probably, flies that are intended for chub fishing, would be rendered more attractive, if they were rubbed with strong cheese, or enclosed in a box with some.

In angling with a ledger for barbel, from a punt, have some well-worked clay, let it be made into hollow balls, four or five inches diameter; fill these balls with lob worms, close them up well, leaving a tail or two of them a little projecting; put one now and then gently into the water over the side of the boat, it will descend gradually to about the place where your bait is placed, which should be a good

maiden lob worm, well scoured, in a piece of damp, old greasy net, taking care there is no salt in the greasy water in which the net has been moistened, or wash it in some fat mutton broth, which has neither spice, salt, or pepper in it.

Another ground bait for barbel is hollow balls of clay with a little pounded greaves mixed up in them; the balls to be filled with boiled greaves, and liver gentles.

Another for roach and dace: a smaller hollow ball filled with liver gentles, sticking a few outside.

The rationale of this is, that the fish being attracted to the balls by that which is outside, and probably smelling something in the interior, which they desire to appropriate to themselves, will knock and rub themselves against it, till with that, and the action of the water, the ball breaks, and the contents attract numbers of fish to the place; if now you give them a superior bait on your hook, you will be certain to have the largest fish; if you ground bait with worms, use a fine scoured worm, as before observed, on your hook; if the ball contain greaves and liver gentles, use on your hook a picked piece of scalded greaves, and on the point a fine gentle; and so with roach and dace, bait with fine gentles.

That the above rationale is the true one, may be proved by watching the motions of the fish in clear water.

These balls do not answer so well to throw off a bank; but if the clay be well tempered, and the balls made small, they may be placed in the swim by the contrivance of a piece of board, or a small imitation of a baker's peel. In still water they answer very well. Do not be afraid of alarming the fish; such is their Eve-like propensity, that if a stone be thrown in, a congregation of fish will soon assemble around it, an irrefragable proof of the acuteness of their sense of hearing; and I do not advise placing the balls of ground bait gently in the water from fear of frightening the fish, but to prevent the balls from breaking by throwing them into the water.

Balls made with clay and finely ground malt, or clay and fresh grains, or clay and boiled rice, or clay and liver gentles, or in a still place chewed bread, or a spoonful of common gentles, or for chub, bran, scalded bread, and very strong-smelling cheese; bait with honey paste mixed with cheese. In a quiet eddy, small pellets of paste made with bread, and a little moist sugar; bait with honey paste.

Most of the ground baits will not keep over twenty-four hours.

An old work on angling advises paste made by dipping the bread in liquor in which greaves have been boiled, as an excellent bait for barbel. Is this taste or smell that prompts barbel, chub, and carp to prefer greaves, cheese, and honey?

I have always found it advantageous to ground bait over night, for the morning's fishing; and on leaving off, to throw in the remainder of my ground bait and paste, gentles, or worms, particularly if I intended to angle the next day.

Some authors advise boiled potatoes, to be mixed with bread, bran, and barley-meal. Depend upon this as a fact, that judicious ground-baiting is the most sure method of obtaining sport in bottom-fishing.

A good paste for chub, in the cold months, when they lie at the bottom, is the crumb of a roll, honey, and the strongest-smelling cheese you can obtain; work these well together with saffron, to colour, or without it; make small balls of scalded bread, a little clay, and strongest cheese; fish in an eddy, and throw in small balls, or rather pellets, occasionally.

Or a very killing bait for chub is, sheeps' or bullocks' brains boiled, and made into a paste, with a little strong cheese, and bread just dipped into water, throwing in little pellets of the same continually.

Gudgeons are in season in the spring, as soon as the weather becomes warm. They are not allowed to be angled for in the Thames before the first of June, and they will bite from an hour after sunrise until an hour after sunset. The small ones of this fish are used either as spinning baits for trout, or alive

for them and perch, and on trimmers or night lines for large eels, and the larger size for pike; they are sold at the fishing-tackle shops. By a work published one hundred years ago, gudgeons were then very plentiful in the Mersey; they are, however, common in most rivers, if the bed of it be sand and gravel; but of late years there have not been so many in the Thames as there were formerly.

The blood-worm, found in large quantities on the surface of mud, appears as if it were formed of ten or twelve little globes, connected with each other, diminishing rapidly in size near the tail; the head is the largest part of it, and seems as if there were a mouth always open, with three little forks protruding; it is of a bright crimson colour, and a most disgusting thing to handle; the myriads of gnats that fly about on summer evenings spring from this worm. Near Whitehall Stairs the surface of the mud generally looks red, and the vulgar opinion is, that this appearance was never seen before the decapitation of Charles the First; the plain fact is, the blood-like colour arises from the immense quantity of blood-worms about that spot, probably existing as long as the substance in which they live and breed was deposited there; more recently they may be observed, when the tide is out, in the mud off Temple Gardens.

Gudgeons in the Thames are usually angled for

from a punt; three persons can very conveniently occupy one, with the fisherman. It is not uncommon to see ladies and gentlemen enjoying this sport; the anglers sit in chairs, the fisherman plumbs the depth, arranges the floats, baits the hooks, rakes the gravel, takes off, and puts the fish into the well of the punt, and if sport become dull in one spot, moves the boat to another: it is not uncommon to see the anglers with gloves on. Most persons cause refreshments to be conveyed on board, and it is a very pleasant way of passing a summer's morning. The hours of angling are generally from ten or eleven till four or five; and the take with three rods varies, according to the judgment displayed by the boatman, the goodness of the tackle, and the degree of skill of the anglers, and will be from eight to twenty dozen of fish, which the fisherman takes out of the well, counts, and conveys to your inn or lodgings. The season is from the first of June till the twenty-eighth of February, the same as the season for roach and dace in the Thames, but is different in the Lea.

In the Thames small short red worms with a yellow tail are the best bait; the hook should be tied on very fine gut, because perch sometimes visit the spot to pick up a young gudgeon, and will in most instances take your worm, and would probably break away if hair were used. It is also very necessary to have

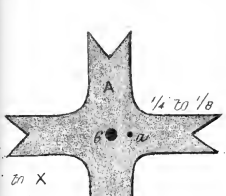
proper tackle for pike, as they are sometimes attracted by the shoal of gudgeons; and if your sport for those small fish fail, it is probable one of those fresh-water sharks has intruded on your fishing ground.

Some persons prefer angling from the bank, so as to be able to move about, or do not choose to be at the expense of a punt and fisherman. It is useless to expect sport unless the gravel be raked; I, therefore, invented, many years ago, a *portable* gudgeon-rake, with bayonet joints, it being nearly impossible for an angler to convey one of those in general use to any distance. My first rake of this kind was sold with my other fishing tackle, when obliged to sell it, as I before-mentioned, in France; that one had a large jointed iron landing-net ring, with net complete, which by removing the rake fitted the screw, and which I found useful, as I have said, in fishing for crabs; the rake and ring of the net should be coated with black varnish, and I had a hole through the rake, and a small brass staple on each joint, through which a piece of plaited cord passed, to prevent losing any part of it. Mr. Anderson, of Long Acre, a year or two ago, carried out my original plan; but since he has made the folding rods, I think the plan would be advantageously adopted for this indispensable adjunct to a gudgeon-fisher's apparatus.

The gudgeons in the Lea are more fastidious than

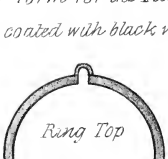
RIGHT'S PORTABLE GUDGEON RAKE.

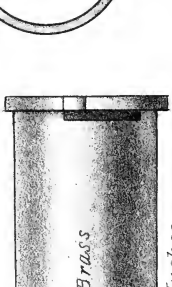
See Appendix



A·B. *Either form for the Rake.*

All Iron Work coated with black varnish.





Thick Iron Ferule
PAGE
to 1 Inch.
Brass staple Pin for Bay-onet Joint
Nº Pin.
Pole well coated with several coats of Copal Varnish
Dº Pin.
Ash 1 1/2 Inch diminishing to 1 Inch diameter at top.
Hole for fastening Cord.

STANNARD & D

their brothers and sisters of the Thames: the former must be angled for with a very fine hook of thin wire, tied on single hair; the bait must be blood worms; the angling is from the bank, and the occasional angler must either hire or borrow a rake to take into the marshes with him, a load for a donkey; and he must rake, bait, and unhook his fish. The gudgeons in the Lea are not so numerous as those in the Thames, but they are mostly of a good size.

This species of fish do not generally weigh more than four ounces, or exceed nine inches in length; but one was, it is said, taken at Uxbridge, which weighed half a pound.

A village on the Loire, between Orleans and Blois, in France, is celebrated for the quality, size, and cooking of its gudgeons.

Roach fishing is also practised from punts, in the Thames, at all the stations from Richmond upwards; and an immense quantity of roach are taken, very much under the size allowed by Act of Parliament; if many of those who angle would but adhere to the law on the subject, and set at liberty again all roach under eight inches from the eye to the end of the flesh at the middle of the tail, this species of fish, of a size good for something when caught, would be plentiful. At Richmond, a gentleman with whom I am acquainted, about four years ago, caught a

roach weighing four pounds, which was preserved, and shown to numbers of persons.

Many anglers fish in the Thames off the banks, for roach; and at the Island, or Ait, just above Hampton Court Bridge, called the "Angler's Retreat," is a very quiet retired place; from its banks many roach are taken. In the Weir hole, at the end of the Ait, large trout, chub, pike, and barbel are caught; also in the Tumbling Bay Hole;—in fact, I do not know any portion of the Thames having a more extensive range for an angler. HARVEY, the tenant of this island, and his family, are most civil, accommodating persons; he is licensed to sell beer, and furnishes dinners, tea, &c.; the charges are very moderate. If he would constantly ground-bait the waters around the Island, he might have the majority of the fish in that large expanse of water from Teddington Lock up to the Tumbling Bay, on one side of the island; and from Moulsey Lock to Sunbury Lock on the upper side, constantly about it; and no angler would go thither, if at all competent, without finding sport. His inclination is good to carry out the advice of his friends, but his means are not equal to the performance of this necessary, and advantageous duty to himself, and family, who would be so much benefitted by the number of anglers, which the certainty of sport would attract to his domicile. The railway to Hamp-

ton Court has its terminus close to the Ait; and there are some excellent fishermen at Moulsey, close to Hampton Court Bridge.

Sunbury, Walton, Weybridge, and Chertsey Bridge Fisheries are all at considerable distances from the respective railway stations; though there are always conveyances to be had on very reasonable terms. The landlord of the inn at Chertsey Bridge has generally a fly ready to convey anglers from the station of the railway to the river, and to take them back.

Punts, fishermen, baits, and every accommodation can be obtained at all the principal villages and towns on the banks of the Thames; and it is more pleasant to have a companion for barbel fishing, which is a great source of amusement at the proper season. For gudgeon fishing, a punt will very conveniently accommodate two gentlemen and a lady, or two ladies and a gentleman. The panoramic map of the Thames, by Reynolds, 174, Strand; and the two maps, for anglers, from Richmond to Henley, and from Henley to Oxford, by Netherclift,—will be found most valuable guides for sportsmen on our noble river.

I have been informed, that in the neighbourhood of Ashton Keynes, a little above Cricklade, there are trout from six to eight pounds each; the water is

very strictly preserved; but gentlemen properly introduced are allowed to angle with a fly.

At Pangbourne, also, it is said, there are large trout in the Thames.

I was out in a punt, at Maidenhead, with an experienced fisherman, and tried spinning, and fly-fishing during a whole day; I had not a run with the former, and only took some chub with the latter. I was afterwards told, there was too much netting going forward in that neighbourhood.

The river Loddon, which enters the Thames opposite Shiplake, has the reputation of producing large pike, and they are said to be numerous.

In the New River, above Hornsey, at a bend where the water is wide, I have been informed dace of three-quarters of a pound each are frequently caught with a fly, similar to the cock-tail of the Wandle; and that in flavour they are equal, if not superior, to many trout. In the preserved parts of this river, about Southgate, Enfield, Winchmore Hill, &c., there are carp, pike, chub, dace, large gudgeons, and eels, all of a peculiar excellence.

In the river Rib, where the road crosses it, at Wade's Mill, about two miles from Ware, near Thundridge, there used to be abundance of trout; but I cannot tell what there may be now. Also, at a flour mill, about two miles beyond St. Albans.

The laws regulating the size of fish allowed to be killed, it is proper to notice.

By 1st of Elizabeth, cap. xvii., no *pike* to be taken under ten inches, from the eye to the end of the flesh in the middle of the tail: *salmon*, sixteen inches: *trout*, eight inches: and *barbel*, twelve inches; all measured in the above manner.

By 3d George II., cap. xxi., *roach* not to be taken in the Thames under eight inches; or dace under six inches, measured in the above manner. Where there is one taken of the legal size, there are tens of thousands taken under four or five inches, which are useless as articles of food, but are thought much of by Cockney anglers.

By 33d George II., cap. xxvii., no person shall take, or have in his possession, on water or on shore, or sell, or expose for sale, any unsizable fish, or fish out of season; nor any *smelt* less than five inches long, measured as above: and any person may seize all such unsizable fish, or fish out of season, with the baskets and package, and charge a constable with the offender, and the fish, basket, and package to be taken before a justice of the peace; and on conviction, the whole goods to be delivered to the prosecutor, and the offender shall, besides, forfeit twenty shillings, half to the poor of the parish, and the other half to the prosecutor; and in default of payment,

the offender may be committed to prison, and hard labour, for any time not exceeding three months. The penalty may, at the option of the magistrate, be reduced to one half.

Any person catching, and offering salmon for sale, of less than six pounds weight, forfeits £5; and the same penalty attaches to the buyer and the seller, with forfeiture of the fish. The £5, half to the poor, and half to the informer; distress upon goods for penalty; if no goods, commitment for three months, unless the penalty be paid. 1st George I., cap. xviii. sect. 15.

A few observations on the laws regulating angling may be useful. In *navigable* rivers, the proprietors of the land have no exclusive right, that is, no one can prevent a person from angling from the *towing path;* or in a boat close to the private grounds of an individual having such on the bank of a *navigable* river.

Navigable canals having a towing path, or footway, by the side of them, become, in fact, the King's highway; but I cannot find that the question has been mooted as to the right of angling in a canal made by a company of persons, who have purchased the land through which they have cut the same; it is reasonable to think that the company could prevent any person from angling therein, unless they

have waived the right for thirty years, as the law now stands.

The 7th and 8th of George IV., cap. xxix. sect. 34, enacts that any person unlawfully and wilfully taking or destroying any fish, in any water running through, or being in any land adjoining or belonging to the house of any person, being the owner of such water, or having a right of fishery therein, shall be guilty of a misdemeanour, and being convicted thereof, shall be punished accordingly: And any person unlawfully and wilfully taking and destroying, or attempting to take and destroy any fish in any water not being such as aforesaid, but which shall be private property, or in which there shall be any private right of fishery, every such offender being convicted thereof before a Justice of the Peace, shall forfeit and pay, over and above the value of the fish taken or destroyed, (if any) such sum of money, not exceeding five pounds, as to the Justice shall seem meet: Provided always, that nothing herein before contained shall extend to any person angling in the day-time; but if any person shall, by angling in the day-time, unlawfully and wilfully take or destroy, or attempt to take or destroy any fish in any such water as first mentioned, he shall, on conviction before a Justice of the Peace, forfeit and pay any sum not exceeding five pounds; and if in any such water as last mentioned,

he shall, on the like conviction, forfeit and pay a sum not exceeding two pounds, as to the justice shall seem fit."

Section 35 enacts, "That if any person shall at any time be found fishing against the provisions of this Act, it shall be lawful for the owner of the ground, water, or fishery, where such offender shall be found, his servants, or any person authorized by him to demand from such offender, any rods, lines, hooks, nets, or other implements for taking or destroying fish, which shall then be in his possession: and in case such offender shall not immediately deliver up the same, to seize and take the same from him for the use of such owner: Provided always, that any person angling in the day-time against the provisions of this Act, from whom any implements used by anglers shall be taken, or by whom the same shall be delivered up as aforesaid, shall, by the taking or delivering thereof, be exempted from the payment of any damages or penalty for such angling."

How far this act may operate against the former laws and judicial decisions still in force, must be left to the sages of the law to determine. I merely give these sections of the Act from the Act itself, with all its tautology, &c., &c.

No respectable angler will attempt to angle in a private water without the permission of the owner,

and any unprincipled person who does so, deserves every punishment the law may award to him.

On the 25th of October, 1785, the Lord Mayor (Richard Clarke) and the Court of Aldermen made a law, that no person should angle in the Thames on Sundays, under a penalty of forty shillings. Anglers therefore sought other streams; and it was observed, I remember at the time, that there were as many, if not more anglers, than before that *civic* law was promulgated. His Royal Highness the Duke of York, BISHOP OF OSNABURGH, went to live at Oatlands soon after, and it was a regular practice for him and his company on *most Sundays*, in fine weather, to be out in punts, as I have often seen them angling in the Thames. The example of his Royal Highness, as may be well supposed, rendered this most unpopular law of the Lord Mayor and Aldermen perfectly unavailing; for they were afraid to attack ROYALTY and EPISCOPACY, and could not reasonably attack the poorer orders. It was a law which they had, in point of fact, it was said by legal men, no power to make. This obnoxious attempt to interfere with the liberties of the subject remained in a state of abeyance till September, 1840, when John Tagg, of Thames Ditton, fisherman, was summoned before the magistrates, at the Town Hall, Kingston, for angling in the Thames on Sunday, the 6th inst. Mr. Guy, for the defend-

ant, contended that the Lord Mayor and Aldermen had no power to make any such law; the justices thinking such power was given by an Act of Geo. II., fined him in the lowest penalty, twenty shillings. The only power the Lord Mayor and Aldermen ever had by that or any other Act as to fishing in the Thames, was to punish persons for using unlawful nets or engines for taking fish, or, becoming public prosecutors, proceeding against persons for taking them under the specified sizes mentioned in Acts of Parliament; but neither the Corporation or its officers do this duty. The persecution of John Tagg, who is esteemed as a most quiet, industrious, and respectable man, it was ascertained, originated with a confederacy of Puritans, of whom the general opinion was, that they would have been better employed in attending to their own *duties*.

Many very severe observations were made in the public journals upon this transaction, which it is not necessary to repeat, and it brought to light another *insane*, but abortive attempt, to involve the chief magistrate of the city, in a still more extensive interference with the pleasures, the comforts, and the commerce of the river Thames; fortunately the Lord Mayor possessed too much good sense, to aid or abet the scheme of putting a stop to *all traffic* on the Thames on Sundays, and probably it was *fortunate*

for the proposers of it, that he acted with such caution, and thereby saved *them* from the *consequences* which might have ensued.

I am not about to enter into a discussion whether angling on Sundays, not in the Thames alone, but in every other water should be prohibited; but I will mention a few of the persons who would be injured most seriously by any such prohibition. The owners of fishing-tackle shops in London would lose a considerable portion of that trade which they have engaged in for the support of their families. The fishermen on the Thames would lose probably one fifth or more of their present incomes. The proprietors of houses of entertainment frequented by anglers, who have paid large sums in the way of good-will, fittings-up, &c., would, many of them, become insolvent.

The fascination which exists in *seeing* fish caught, pervades all classes of society; and if to a passive spectator it is so attractive, how much more so is that of being the active agent, by whose skill in adapting baits and tackle the most cunning of the finny tribe are captured; and if anglers of the middle and poorer classes could have their amusement interfered with by a legislative prevention of Sunday angling, such is the paramount influence of this sport, that many artizans and others would neglect their

work at a great loss to their employers, and their own families, in order to have a day's angling. A scene that actually occurred in the Homerton Marshes, may illustrate this fact.

A man was at the above spot angling, when a gentlemanly person approached, and the following colloquy ensued:—

Gentleman. Good afternoon, friend. Have you had any sport?

Angler. Not much, sir... Only these.

Gent. How long have you been at it?

Angl. Ever since four this morning.

Gent. What are you? Any trade?

Angl. Yes. A weaver, sir.

Gent. What can you earn a day at your trade?

Angl. About seven shillings.

Gent. Have you no work at home?

Angl. Yes, sir; plenty.

Gent. What are these fish worth?

Angl. I cannot say, sir; no great deal.

Gent. But suppose when you go home, if you were to offer these fish for sale, what would they fetch?

Angl. (Laughing.) Oh, I do not think they would sell for sixpence.

Gent. Indeed; do you see yonder house? That is a mad-house; put up your tackle as fast as you

can, for if the master, or any of the keepers see you, they will lock you up as a madman.

The gentleman then walked rapidly away.

Very soon after, the angler was *rather startled* by seeing two men issue from the house, and approach him hastily; they inquired if he had seen a gentleman pass, describing him, and if so, which way, and told him that the gentleman was a lunatic who had escaped. The angler pointed out the way the gentleman had gone, and he was soon captured. The master of the establishment went out and thanked the angler for the information he had given, which led to the capture of his patient, and seeing the angler was poor, made him a present for the assistance he had rendered, when the angler repeated the conversation that had taken place, and it found its way into "*Examples of the lucid intervals of insane persons.*"

Another anecdote, though not relating to angling, showing the acute reasoning of insane persons during their lucid intervals, may probably be admitted here. M. Baron, who was, previous to the Reign of Terror in France, during the first Revolution, the most celebrated harlequin of the French stage, was obliged to fly to this country for safety, and first became head waiter, and afterwards proprietor of the *Café de quatre Nations*, at the corner of Nassau and Gerrard Streets, Soho. About 1807-8 I frequently dined at

the house, and heard the following related as having actually occurred there. A poor man stationed himself so as to enjoy the savoury smell emanating from the kitchen, and ate a piece of dry bread; no doubt knowing that M. B. was a humourist and a kind-hearted man, and that he was then within hearing, said, "Well, I have now enjoyed my dry bread under the smell of this cookery, as well as if I had gone inside and had my dinner." M. B. told the man, that as he was so satisfied, he (M. B.) thought he ought to receive some payment for the advantage derived; to which the man demurred, saying he had had no property of M. B.'s; that which he enjoyed cost M. B. nothing, and he had no power over it. M. B., seeing a gentleman coming down Nassau Street, proposed to refer the case to him. The gentleman, on being addressed, stopped, very civilly heard the statement of both parties; he then asked M. B. for two clean plates, and the poor man for a piece of money; he turned one plate over the other, placing the money between, and holding them near M. B.'s ear, caused the money to rattle between the plates, asking if he heard that; on M. B. replying in the affirmative, he returned the money to the poor man, and the plates to M. B., saying, "This case having been referred to me, I decide, that as the poor man has been satisfied with the *smell* of your meat, you must be satisfied

with the *sound* of his money;" the gentleman then walked away along Gerrard Street. M. B. called one of his waiters to give the poor man some cold meat, but before it could be brought, a person came in haste to M. B., describing the gentleman who had acted as judge; and being informed the route he took, followed, arrested his further progress, and brought him back past the café. He proved to be a lunatic who had escaped from his private keeper.*

I was walking in the meadow by the Horse and Groom, Lea Bridge, on the Essex side, one Sunday afternoon, having gone thither merely for the advantage of the fresh air, but not to angle. On the opposite side sat an angler, patiently watching the motion of his float; a person who appeared to be an acquaintance, and who was near me, called to the angler, and asked how long he had been there; the angler replied, "Ever since one this morning; I came down last night to bait this place, and I was here so early for fear any one else should take it." On being asked by his friend what sport he had had, he stooped down, pulled up a piece of twine, attached to which was a carp, apparently about five pounds weight, by one end of the twine being passed through the fish's mouth and brought out at his gills, in order to keep it alive;

* There have been several versions of this occurrence published, but this I believe to be the true one.

whilst holding his prize, with great exultation at his good fortune, the fish gave a caper, the knot slipped, and the carp descended into his native element, to the great vexation of the poor angler, whom I think every one who saw it pitied very sincerely.—A type of this world, when we think our labours have been crowned with success, it all dissolves, and "like the baseless fabric of a vision, leaves not a rack behind."

Anglers form a most numerous and influential class of the community; but for every respectable one who can afford to fish *any day* in the week he may think proper, there are probably fifty respectable individuals who cannot devote any other time than a portion of Sunday to their favourite sport, which induces them to go into the country, whereby they cleanse their lungs from the foul air they have breathed for the previous six days; and there are an equal number of the inferior class who are attached to this amusement. Now taking the whole of the disciples of Izaak Walton, there cannot be found a more quiet, orderly, and temperate set of men than they are; and though I am not a Sunday angler myself, yet I know many most moral worthy men who are; and feeling as I do that angling is truly the contemplative man's recreation, and that the wisest and best of men in all ages, distinguished for amenity of temper, scientific attainments, and unaffected piety of life,

have been lovers of the art which requires quiet and solitude. No man surrounded as he must be, thus situated, with the wonders of creation, can fail to look up with veneration and gratitude to the great and glorious Architect of the universe, for the benefits bestowed upon him; whilst the invigoration of mind and body, resulting from exercise in the open air, the change of scene, reanimates the health and spirits, and renders the angler more capable of exertion on his return to the active duties of life.

The antiquity of angling can be proved by reference to the Book of Job, who died 3407 years ago; by Isaiah, who was put to death 2550 years ago; by Plutarch, who gives the scene between Cleopatra and Marc Antony: besides, did not Christ order a hook and line to be cast into the sea, and the fish to be taken? and did he not choose the greater number of the apostles from amongst fishermen? According to Oppian, the Emperor Severus practised the art of angling, out of a boat in an artificially made lake, wherein dainty fish were bred and fed, of a species fit for the royal table. It was the favourite sport of the Emperor Trajan, and in more modern times it has been that of Nelson, Paley, Davy, Chantry, and a host of celebrated characters.

God gave to man the dominion over the fish of the sea, the fowl of the air, and over every living thing

that moveth upon the earth. Man is by nature a carnivorous animal, hence in the rude and uncultivated state of the human race, the support of their lives and that of their families depended upon their skill in the chase, their dexterity and ingenuity in subjecting the feathered and finny tribes to their control and use. Examples of this state of natural liberty have been of late years found to exist, and even at this day there may be undiscovered hordes of uncivilized beings, who individually endure what to civilized man appear hardships, but to the savage is indescribable pleasure, and the chief business of his life.

"Coarse are his meals, the fortune of the chase,
Amidst the running stream he slakes his thirst:
Toils all the day, and at th' approach of night,
On the first friendly bank he throws him down,
Or rests his head upon a rock till morn;
Then rises fresh, pursues his wonted game,
And if the following day he chance to find
A new repast, or an untasted spring,
Blesses his stars, and thinks it luxury."—*Addison,*

This yearning after the delights of the chase, the excitement of the dog and gun, and the amusement of angling, in all its branches, derived from our aboriginal ancestors, is still so strong upon us, in our civilized state, that few persons can be found who do not feel an almost uncontrollable desire to participate

in one or the other of these rural, health-giving sports.

My own experience is, that when I have had an an opportunity of enjoying a few hours' fly-fishing* on the bank of a trout stream, I have found my whole system revivified for some time after. By the inhalation of air, containing a large proportion of pure oxygen, the blood, consequently, becomes oxygenated in a greater degree; the circulation of all the fluids of the body is increased, and healthily improved, for it is scarcely necessary, at the present day, to explain this, when even the more humble classes know the importance of pure air to ensure the health of the body, through the lungs receiving a larger portion of oxygen. The artisan who is confined in an unwholesome atmosphere during six days, requires fresh air to renovate his constitution; and those who desire to abridge his comforts in this respect, are no friends to their fellow beings. They who thus attempt to injure the health of the poorer part of the community, if the Pythagorean system were to be the true one, should be con-

* Fly-fishing is more conducive to health than bottom fishing; for in the former there is considerable exercise for the muscles of the arms, in throwing the line, and for the legs in moving about. Spinning a minnow, and trolling are next in point of advantageous results to the health: another superior advantage of fly-fishing is, that it is practised by the side of rapid and aërated streams.

demned to the same labour, privations, and want of fresh air, to which they would condemn the labouring population; the miseries of which they never knew. No! no! They enjoy the luxuries of life; they take their pleasure in riding, walking, or sporting, six days of the week, and have nothing to think of but their pleasures and comforts.

It cannot be supposed, in this enlightened age, that any attempt could be entertained by the Houses of Parliament to interfere with the innocent amusements of a large proportion of the community. Monomaniacs may propose very unwise laws, and have done so; but the good sense of our legislators have hitherto repelled the propositions. The human mind cannot be coerced, as to its religious feelings; and the endeavour to do so, by the hand of power, is sure to prove abortive. Puritans have subverted the throne, and killed their king in this island; beware of ever letting them be in the ascendant again. Are not the horrible scenes now progressing in India, attributable, whatever may be said to the contrary, to the well-intentioned endeavours to make proselytes to the Christian religion?

I overheard a short time ago, a boy of a respectable family of the middle class, about ten years old, talking to another, about how his Sunday was spent; he said, he "went three times in the day to chapel,

(for his parents were dissenters of some sort) and twice to a Sunday school;" and said he, "Let me get a little older, and I'll have less praying, and some pleasure, for I have none now. God never intended, I think, that we should worry him with prayers, and hymn-singing, and neglect the exercise good for one's health."

Let it not be supposed that I advocate any neglect of religious duties, but I do reprobate causing children, who are naturally volatile, to regard religious duties, by their excess, as distasteful; and thereby lay the foundation of irreligion in the adult. No! let children be taught that it is *degrading* to *themselves* to act improperly; and not that punishment awaits them if they do so, and they will grow up to be honourable beings, ABOVE committing an action which the inward monitor, their consciences, warns them, is contrary to the true principles of moral integrity.

In the Court of Queen's Bench, on 14th November, 1854, in a case of trespass, Bland *v.* Lipscombe, the question involved was, the right of the inhabitants of Leatherhead to angle, with rods and lines, from a certain towing path, on the bank of the river Mole: they pleaded immemorial custom to angle for recreation and not for profit. The plea of the inhabitants was demurred to, on the ground that such angling *must* be for profit. The counsel supporting the

plea said such angling was for recreation, and *not* for profit.

Lord Campbell decided, that as the plea was, that such angling was not for profit, it was bad. So that the demurrer stands good against the plea. Now without knowing any thing of this case, or pretending to give a dictum as to the law, the common-sense of the matter appears to be, that the inhabitants of Leatherhead should have pleaded a prescriptive right, by immemorial custom, to angle with rods and lines from that towing path, and there have stopped: no person goes out to angle without expecting and hoping to take fish; and if any parties have, by immemorial custom, a *right* to angle in a particular spot, they are not accountable to any person whatsoever as to what they do with the fish they may catch, whether they give them away, sell them, or cook them. If they be entitled to angle, they are also entitled to do what they will with the results of their sport. The fish were in a state of *ferœ naturœ*, and become the *absolute acquired* property of him who can catch them; and every angler does fish for the *acquirement* of that which he *has not*, and therefore fishes for *profit*.

A result of this case was, that Charles Lipscomb, a labourer at Leatherhead, applied to be discharged from prison; he was opposed by N. Bland, Esq., of

Randall's Park, Leatherhead. The jury, on the trial in the Queen's Bench, gave a verdict for the plaintiff (Mr. Bland), with £10 damages; and the costs amounted to £154. The insolvent, who was heard on 21st of July, 1855, maintained that he had a right to fish, and that the fish belonged to Mr. Ladbroke, the Lord of the Manor; it appeared that there is a public *foot*-path along the side of the river. Mr. Commissioner Murphy adjourned the case for enquiry whether the inhabitants believed they had a right to fish. If so, he would not keep the insolvent in prison; but if the insolvent had persisted, well knowing he had no right, then he should feel it his duty to give a very serious judgment. The Commissioner has since been satisfied upon that point; and Lipscombe was discharged on 24th July.

In the case previously, as stated by the newspapers, of this action, it was then said that there was a *towing* path by the side of the river Mole, from whence the inhabitants of Leatherhead were, by immemorial custom, entitled to angle with rods and lines; now a *towing* path would indicate that the river was *navigable*, which, according to legal authorities on aquatic rights, would alter the case very materially; for all rivers which maintain a perpetual stream, and are capable of being navigated, are public rivers. But a public foot-path by the side of a river, bounded by

the ground of any person, does not give the inhabitants of the town or village in which such ground is situated any right to fish in that river, unless the said inhabitants can prove that the pathway has been used without interruption; also, that they have angled therefrom during thirty years. If they cannot prove this, any of them who angle from the pathway in question commit a trespass upon the property of the owner of the soil, who has a right to the fishery half way across the river; or the whole, if he be the proprietor of the land on both sides; and the Lord of the Manor, as such, has nothing to do with the fishery or fish.

Mr. Commissioner Murphy made a very sensible and judicious observation, as to sending this case for trial to the Court of Queen's Bench; the matter ought to have gone before a justice of the peace. Mr. Bland should, I think, have proceeded under the 7th and 8th George IV., cap. xxix., sect. 34: however, as that gentleman thought proper to employ lawyers upon the subject, he will now probably have to pay them. Bnt if any of the inhabitants of Leatherhead had been taken before a magistrate for angling, at the place where Lipscombe angled, and proved his right to do so, as before observed, no magistrate could legally convict him under this, or any other act, because the right accrued to such inhabitant by previous laws of

the realm. The inhabitants of Leatherhead will not perform the duty they owe to their children, and children's children, if they do not defend this right of angling, if it be their right. There are too many instances of persons dressed in a little brief authority, or who have in some way acquired wealth, using or abusing their power, to circumscribe the recreations of the more humble of their fellow mortals, particularly in that of angling; but it must be admitted there are a great number of truly noble and wealthy individuals, who act with every possible urbanity and consideration towards those more humbly circumstanced.

A most destructive method of catching trout is, I am informed, practised at, and near Leatherhead, when the May-fly is on the water; it is by a line stretched across the river, to which is affixed a number of hooks, baited with the natural fly. A man on each side of the river lets these baits drop from time to time, and as soon as a fish is hooked, the one poacher, for I can no otherwise denominate them, gives out line, and the other draws it in, and baskets the fish. No one under the title of an inhabitant of Leatherhead, should be allowed to plunder and injure the river in that disgraceful manner. Fellows of that class fish for *profit* only.

Should the *inhabitants* of Leatherhead establish

their right to angle from this foot-path, it will not authorize any visitor to angle there, neither can an inhabitant of that town delegate his authority to another person, who is not an *established* inhabitant.

In the case of Rawlins *v.* Jenkins and others, really versus the mayor, burgesses, and freeholders of Whitchurch, in Hampshire, for trespass, by angling in the river Test, which they could only do by entering a close belonging to the plaintiff, the defendants pleaded a prescriptive right by immemorial custom. The case was tried before Mr. Justice Coleridge, at the spring assizes, held at Winchester, in 1842; and the verdict was, after a long trial, in favour of the defendants. A new trial was granted, and owing to some misconception, the verdict was for the plaintiff. Another trial was applied for on account of the alleged misdirection of the judge; but it was not obtained, so the parties are much as they were, except a *little lighter* in pocket.

In the navigation from Weybridge Bridge to Thames Lock, it is the old river Wey, and above the lock at Weybridge Bridge, to Godalming, it is an artificially made canal; *now*, the proprietors of the whole navigation to Godalming have very injudiciously placed boards forbidding persons to angle: but from Thames Lock to Weybridge Bridge, it is the original river, and probably was originally, ages ago,

navigable up to Byfleet; over that, the Wey navigation proprietors *never* had any exclusive right, and if, by the purchase of the land through which the cut was made above Weybridge Bridge, they in the commencement had any such right over the canal so cut above that Bridge, they have never exercised it, as I can prove, for seventy-five years; and as the best part for angling is in the parish of Chertsey, the authorities of that parish should take immediate steps to prevent the rights of the parishioners from being deteriorated.

In 1509, in an Act passed for repealing a former Act, which was supposed to have an injurious tendency to the interests of fishermen, it is stated, "*that fish are much behoveful, and necessary to the common weal of this realm.*"

First of Henry VIII. states, "That days and meats are indifferent according to the gospel, but that abstinence from flesh meat is a mean to virtue, and to subdue men's bodies to their soul and spirit."

The 2nd and 3rd of Edward VI. imposed penalties on persons eating flesh on fish days; for the first offence a fine of ten shillings, and ten days' imprisonment, and abstinence from flesh during the whole of that period; for the second offence the penalty and other punishments were double. The sick and aged could obtain licenses to eat meat. In 1562 the penal-

ties were increased to £3, and £2 upon any householder who was *cognizant* of the offence, if he did not inform against the offender. A nobleman might eat meat whenever he pleased, if he paid £1 6*s*. 8*d*. per year. A knight might do so for 13*s*. 4*d*., and a commoner, 6*s*. 8*d*. The money was paid into the parish poor-box, under control of the PRIESTHOOD.

Fish of various species could very profitably be bred in ponds in the inland parts of this country, independently of the supply from the sea, and it would be the means of giving nutriment to many families, if the breeding of fish were more encouraged. Eels, for instance, are extremely prolific, and would afford to those who bred them for sale, a most ample return, whilst the outlay would be trifling; they are very nourishing, and persons who feed much on them, as is the case, Mr. Dickens says, of the inhabitants around Lake Como, who are robust and long-lived; whilst sickly neighbours resort to the same locality, and find restoration of their health, through partaking of the same food.

From the same author, in "Household Words," vol. iii. p. 423, we learn the following was a gentleman's directions for a Saturday's dinner, in the seventeenth year of the reign of Harry the Eighth.

"First, leich brayne. Item, frommetye pottage. Item, whole ling. Item, great jowls of salt sammon.

Item, great salt eels. Item, great salt sturgeon jowls. Item, fresh ling. Item, fresh turbot. Item, great pike. Item, great jowls of fresh sammon. Item, great ruds. Item, great turbots. Item, tarts.

"Second course. Martens to pottage. Item, a great fresh sturgeon jowl. Item, fresh eel, roasted. Item, great brett. Item, sammon chines, broiled. Item, roasted eels. Item, roasted lampreys. Item, roasted lamperns. Item, great burbutts. Item, sammon, baken. Item, fresh eel, baken. Item, fresh lampreys, baken. Item, clear jilly. Item, gingerbread."

This could not surely be all served at one dinner, but must be a dietary for Saturdays, when probably one, two, or three of these dishes were indispensable at table, on that day of the week.

Thus our ancestors promulgated laws and orders, relative to the eating of fish, with a view to render persons more chaste, as they did not consider fish conveyed so much nutriment to the human system, or was so exciting to the passions as flesh; in respect to nutriment, their ideas were very erroneous, and also as to "subduing men's bodies."

An opinion has been entertained by some authors on medical subjects, that eels, salmon, herrings, lampreys, mussels and lobsters prove injurious to some constitutions; this is quite true; the first four disagree with many, in consequence of the large propor-

tion of fatty matter which enter into their composition, the fifth I have before explained, and the last from the indigestible nature of its flesh; the effects of the former, are nausea, and probably bilious headache; and the latter, efflorescence of the skin, partially or wholly, with some fever.

In the eastern parts of the world there are poisonous fish, such as the Tetradon Ocellatus of Linnæus, found in Japan, where it is prohibited to be eaten by the officers and soldiers; so in the western there are many of that description, some that will destroy life in half an hour, by exciting the most frightful convulsions; the yellow-bill sprat has this property. Many of the other fishes in the West Indies, which have the character of being poisonous, may be safely eaten if the precaution be adopted to take out every portion of the entrails *immediately* the fish is captured; if it remain long before this be done, the whole fish becomes unfit for food, which appears as if its aliment were of a deleterious nature, and the same thing occurs with the above fish of Japan. This gives a strong reason for adopting the method of taking out the entrails of *all* fish, as soon as possible after they are caught. And much of the injurious properties ascribed to the six species of fish which I have named, may be traced to the length of time they are kept in a state *apparently* fit for food,

after they are dead, by means of ice, and chemical preparations.

Dr. Davy says, "He has made some experiments on the degree of nutriment there is in fish, and the results go far to prove that there is much nourishment in them, little less than in butchers' meat, weight for weight; and in effect it may be more nourishing, considering how, from its softer fibre, fish is more easily digested. Moreover, there is, I find, in fish (in sea fish) a substance which does not exist in the flesh of land animals, viz., iodine—a substance which may have a beneficial effect on the health, and tend to prevent the production of scrofulous and tubercular disease—the latter in the form of pulmonary consumption, one of the most cruel and fatal with which civilized society, and the highly educated and refined are afflicted. Comparative trials prove that in the majority of fish the proportion of solid matter—that is, the matter which remains after perfect desiccation, or the expulsion of the aqueous part—is little inferior to that of the several kinds of butchers' meat, game, or poultry. And if we give our attention to classes of people, classed as to quality of food they principally subsist on, we find that the ichthyophagous class are especially strong, healthy, and prolific. In no other class than that of fishers do we see larger families, handsomer women, or more robust and active

men, or a greater exemption from the maladies just alluded to. Other circumstances may contribute to the beneficial effect, but are not, I think, by themselves sufficient to account for the effect. There are facts of a corroborative kind; such as the well-ascertained efficacy of cod-liver oil—an oil containing iodine—in arresting the progress of consumption; the efficacy of the same substance in relieving or curing some chronic aliments, especially bronchocele; and the virtue of fish diet, of raw fish, as employed in Siberia and Holland, in the treatment of many chronic complaints resisting ordinary medical treatment, of which there are well-authenticated accounts."

Dr. Armstrong, in the "Art of Preserving Health," wrote, about 1747, thus of the inhabitants of some of the frozen regions of the globe.

"Far in the horrid realms of winter, where
Th' established ocean heaps a monstrous waste
Of shining rocks and mountains to the pole,
There lives a hardy race, whose plainest wants
Relentless earth, their cruel stepmother,
Regards not. On the waste of iron fields,
Untam'd, untractable, no harvests wave,
Pomona hates them, and the clownish god
Who tends the garden. In this frozen world
Such cooling gifts were vain; a fitter meal
Is earned with ease; for here the fruitful spawn
Of ocean swarms, and heaps their genial board
With generous fare, and luxury profuse.
These are their bread, the only bread they know."

Recent authors confirm the fact, that there are tribes of human beings who live mostly on fish, and some who seldom partake of other food, yet they are strong, healthy, and active.

The savage aborigines of a portion of New England were formerly entirely supported during a great portion of the year, by the immense quantity of herrings they took at the mouth of one of their large rivers, which they dried in the sun, and used instead of bread. So numerous are the salmon, and its varieties, in the rivers of Kamschatka, that they provide an abundant supply of food for the inhabitants, and the elegantly-formed, resplendent silver-scaled keta, which forms the toukola or household bread of the inhabitants, with all the others, ascend their rivers in summer, and diffuse plenty in these dreary parts of the world. The natives have, during many months, a variety of different species of fish, which not only swarm in different rivers, each choosing its own, but they penetrate to the inland lakes, &c.; and Providence has kindly provided most abundantly, upon the sea shore, two plants of most excellent anti-scorbutic properties, as necessary correctives of constitutions feeding so entirely on fish, much of it dried and salted.

Siberia and Greenland owe much of their food to the salmon, which in one instance force their way up

a river thirteen hundred miles, then across a lake, and ascend another river; and in a second instance pass up a river two thousand miles long. I might enlarge very much on this subject, but I think what I have stated is enough to prove that fish afford a great proportion of nutriment, and every protection should be extended to them in all countries, by preventing their being taken when full of spawn, and also in these kingdoms under the size fixed by law. This year* all fish were very late in depositing their ova; and in the neighbourhood of Hampton Court, there were a very large number of roach, dace, and chub taken during the fence months, whereby millions of fish were destroyed. A most unsportsmanlike plan was also resorted to, by drawing a cluster of naked hooks across little channels, which the fish were endeavouring to get up to spawn, whereby hundreds were caught, and double the number injured. Where was the society's water bailiff? or the Conservators (?) of the Thames and their officers?

It would assist the naturalist, as well as the angler, most essentially, if they could see fish in their native element at considerable depths. Some time ago there appeared in the "Northern Warder," observations to the following effect, under the head "Norwegian Water Telescopes.—This appears to be a tube three

* 1856.

to four feet long; the fishermen immerse one end in the water, and leaning over the gunwale of their boat, and allowing no light to come to their eye, they look through the glass, whereby they can see objects perfectly clear, ten to fifteen fathoms deep, or sixty to ninety feet. Navy and coasting vessels of Norway carry them to examine if their anchors be foul. They have been introduced and used on the Tay, whereby in twelve feet water everything is seen as if at the surface. The meanest fisherman can make them." I should think our Baltic fleet availed themselves of this invention to aid their navigation, or to detect any dangerous snare laid for them. I wrote to Admiral Dundas on the subject, when he commanded in the Baltic, knowing him from his having been my patient: he called and thanked me on his return.

Mr. Leslie, of Lausenburgh, U.S., has constructed an instrument for examining the beds of rivers, or other situations under water, to facilitate excavation, speedy discovery of drowned bodies, or of lost property. It is by the addition of lamps useful at night. I have not seen any instrument of the kind in this country; and if it be useful as stated, it should be brought into notice. A tolerably clear explanation of it is given in the "Journal of Science, Literature, and the Arts," No. xxxv., 1824: John Murray, Albemarle Street, London.

I think this instrument may be very much improved, and intend endeavouring to do so.

Fly-fishing in the Ganges.

"The *science* of fly-fishing is completely set at defiance, and rendered comparatively futile, in many parts of the Ganges: for instance, at the junction of the Soane. Fancy a noble river like the Ganges, fed by the everlasting snows of the Himalaya, and the countless streams which add their silvery tribute from every glen and ravine along its course. Picture this impetuous torrent, after being fretted into foam amongst the rocky chasms of its native mountains, leaping joyously into liberty and light, and roaring triumphantly as it bursts from its long confinement, and flings its glittering spray through its romantic gorge of Tapabund, hurrying along tumultuously to the open sea! Fancy a twenty-eight pound marseer at the end of your line, where the Soane (itself also a river) mingles its waters with the heavy billows of the Ganges. The fish makes directly across to the rapid, where the best boat that ever stemmed a tide would be shattered into a thousand splinters; there is a sweeping bay to the right, which totally prevents your moving from the spot.

"The marseer is a gallant fish; and an active one in prime condition. Rebellious at the trick you played

him, and determined to go headlong down yon foaming rapid, he springs away, making the water fly from your line like smoke; and now he has caught the additional impetus of the roaring stream as it hurries to the fall. Place your finger on the line. What! it cuts you, does it? I defy you to feel your fish, as a skilful rider does his horse; the fish *will* go, and you *must* let him; he has only been two minutes hooked; your line is all out (200 yards) and you are up to your chin in the water. And now, hold hard, science is vain. All you can do is, to give him the butt, trusting alone to the strength of your treble gut bottom, and the elasticity of your rod and line.

"If any sportsman should affect to drop the corners of his mouth at the sport I have described—but faintly, I should delight to see him with 'a go-a-head varmint' on the hook, at the above sport; and if he were able to manage him in the known rules of angling science, all I can say is, that I would 'hide my diminished head.'"

A gentleman to whom I shewed this, which I cut out of a periodical, enabled me to correct the printed statement; and informed me that he had angled in the river Soane; that he had always from 200 to 250 yards of line on his winch, which frequently would be all run out; that he was obliged to wade, but *not* up to his *chin;* that the sand of the river is very fine,

and shines like gold, and that the shores abound with beautiful agate pebbles.

"HINTS FOR ANGLERS.—Never mind what they of the old school say about 'playing him till he is tired.' Much valuable time, and many a good fish, may be lost by this antiquated proceeding. Put him into your basket *as soon as you can*. Everything depends on the manner in which you commence your acquaintance with him. If you can at first prevail upon him to walk a little way down the stream with you, you will have no difficulty afterwards, in persuading him to let you have the pleasure of seeing him at dinner.

"Do not leave off fishing early in the evening, because your friends are tired. After a bright day, the largest fish are to be caught by whipping between sunset and dark. Even, however, in these precious moments you will not have good sport, if you continue throwing after you have whipped your fly off. Pay attention to this; and if you have any doubt after dusk, you may easily ascertain the *point*, by drawing the end of your line, quickly, through your hand, particularly if you do *not* wear gloves.

"When you have got hold of a good fish, which is not very tractable—if you are married, gentle reader, think of your wife, who, like the fish, is united to you by very tender ties, which can only

end with *her death*, or *her* going into *weeds*. If you are single, the loss of the fish, when you thought the prize your own, may remind you of some more serious disappointment."—Jesse's "Natural History."

I have mentioned the antiquity of angling; the noble, good, pious, and learned men who have practised and patronized this recreation; but it has also had some well-known opponents; for instance, the float-fisher, drew from the prejudiced and surly Dr. Johnson, the very amiable and agreeable expression of his opinion—that it was an amusement carried on by "a stick and a string, with a worm at one end, and a fool at the other." And he, in the plenitude of his self-conceit and ill-nature, *fancied himself a wit*, in uttering this sarcasm. The fact was, he was so near-sighted he could not see a float; and, therefore, never could know what the sport was: and as to fly-fishing, it was totally beyond his comprehension.

Lord Byron also wished to be considered witty on the subject:

> "And angling too, that solitary vice,
> Whatever Isaac Walton sings, or says,
> The quaint old cruel coxcomb in his gullet
> Should have a hook, and a small trout to pull it."

The noble (?) lord was lame, and could not enjoy the amusement *latterly*, though he did when young, according to Hofland, in the large ponds at Newstead

Abbey. So he was like many others in this world of ours, who

> " Compound for sins they are inclined to,
> By damning those they have no mind to."

Note.—Izaak Walton died 14th December, 1683, æt. 90 years.

Peter Pindar too, in taking the part of the fish against the angler, says—

> " And when he tries to pull thee out,
> God give thee strength, thou little trout,
> To pull old Izaak in."

Dr. Walcot was a *professed* cynic, who lashed, or *flattered himself* he did lash, everybody, poor old King George the Third not excepted; but in the majority of instances, though his satirical poetry might produce a momentary laugh, the shaft which he attempted to point with wit, very often fell harmless to the ground, through the ill-nature displayed towards worthy and estimable characters.

> " For his censure was praise, the enlightened allow,
> And not *laurels*, but *thistles* oft adorned his poor brow."

There are many accounts of fish which have the power of traversing the land as well as the water, or of climbing trees. Mr. Yarrell very kindly lent me Dr. Francis Hamilton's (formerly Buchanan) account

of the fishes of the river Ganges and its branches; from which I make the following abridged extract.

The fish to which this faculty of ascending trees is attributed, is called the Coius Coboicus, or the *climbing perch*; the fin of its tail is nearly rounded; it has seventeen prickles, and eight soft rays in the united fins of the back, with ten prickles and ten soft rays in the fin behind the vent, with faint black belts traversing the sides.

Captain Daldorf, a Dane, "Linnæan Transactions," vol. iii. p. 62, states, that he saw one of these fish climbing up a palm tree.

This fish is found everywhere in the marshes, ponds, and ditches of India; although it abounds in sharp bones, the natives of Calcutta use it much in diet; the women believing that it increases their milk, and the men that it possesses great invigorating powers; it seldom exceeds six inches in length. It has beneath each eye a horny process, indented on the lower edge, and ending before in a sharp point, which the animal can, at pleasure, turn out.

Each gill-cover consists of three plates—the two hindermost of which are indented with numerous strong parallel spines; all these are powerful organs of locomotion, when the fish is on land.

A climbing fish was known to the Greeks; but though mentioned by Oppian, in about twenty differ-

ent parts of his "Halieuticks," and most curious qualities attributed to it, we do not correctly know this fish, the *preke:* "he has eight long legs or fibres, four on each side of his head, which serve him to crawl, cling to the rocks, and entangle his prey." The above poet says, book iv., verse 335,

> "With all the transports of an eager spouse,
> Th' enamored *preke* gallants Minerva's boughs.
> Surprizing singularity of love!
> That brutal souls a leafy fair should move,
> And fishes court the daughter of the grove."

In the following lines it is stated, that where near the shore an olive tree is found, with swelling berries and luxuriant boughs, the preke will ascend it and remain.

> "But when remiss exhausted nature lies,
> Back to the sea the languid crawler hies,
> Satiate with love and vegetable joys."

The Grecian fishermen avail themselves of the propensities and passions of fish, for loading a bough of the olive-tree with lead, they drag it along deeply depressed, at the stern of their boat. The preke entwines himself amongst the branches, allows himself to be drawn into the boat, and only relinquishes his hold of the bough with his life.

Another curious passion in fish is, that of the sargo,

(see Willoughby, p. 260 and 309. tab. v. 4,) for goats; which, when the animals are driven into to refresh and cool them, these fish tumultuously throng and gambol amongst the goats.

The fishermen of that period, clothed in a goat skin, with the horns on their heads, walked into the water; the fish crowded around, they baited with goat's fat and flesh incorporated with flour, and the fishermen endeavour to take every one of the shoal; but should they not have sufficient rapidity of motion, and dexterity to jerk the fish up and instantly cast it ashore, the other fish discover the cheat, and instantly leave the spot, nor will even real goats tempt them to return. The fish are large, and the rods and lines must be stout. Does not this caution of the fish appear very like a reasoning faculty ?

This fish, it appears, has the power of moving about when out of its native element, and might possibly get on the branches of trees hanging into the water. There is no known fish which can exist so long without water, as they are brought to Calcutta market, and are alive in dry earthen pots at the end of five or six days.

This is one of the fishes supposed to fall with rain from the clouds, which is no doubt erroneous, for during the dry season the waters it inhabits are reduced by evaporation, and it exhausts its food, when

the rainy season commences, like a larger Indian fish, it moves from its uncomfortable position, and is found wriggling and leaping amongst the wet grass.

Dr. Hamilton mentions several other curious animals of the fish species, of which I shall give a concise account. A fish at Bengal called by the English the SABLE fish, said to be the highest-flavoured fish known, being like a compound of salmon and herring. Not, I imagine, a very delicate flavour.

CYPRINUS ROBA, one of the carp tribe, about two feet long, very few bones.

CYPRINUS CATLA, three to four feet long, fat and delicious when not too large, those which are become so are rank tasted; this fish is free from bones.

CYPRINUS CURSA, two to three feet long, very like the English tench; the natives entertain the opinion that if this fish be eaten on the same day that milk is drank, the person so doing will be afflicted with the disease called *Elephantiasis*.

CYPRINUS ROHITA grows to three feet long, much propagated in ponds, a most excellent and valuable fish; but like our own carp, those from rivers are much superior in flavour.

CYPRINUS PUTITORA, in the eastern part of Bengal; they are found sometimes nine feet long, and their scales so large as to be made into gambling cards; these also are free from bones.

Pliny, "Hist. Mundi," L. IX. c. iii., says eels are found in the Ganges *three hundred feet long!* but Dr. H. says he never saw or heard of any larger than those of Europe.

Another species of eel found in the estuaries of the Ganges are said to grow to seven cubits and a-half long, or about thirteen feet; but Dr. H. says he never saw one that measured half that length. As the tide comes up into these inlets, the eels taken there are most probably congers, and many of that tribe may be much longer than the above dimensions.

A genus called OPHIOCEPHALUS has a great number of species; these all afford a light and wholesome, though rather insipid diet. They are very tenacious of life, indeed so much so, that in China they are often carried in vessels of water, and slices are cut for sale as wanted; these slices selling dear whilst the fish retains life, but that portion which remains after the tortured fish has ceased to live, is considered valueless. Some of this species are from two to three feet in length. Our gastronomists probably learned the art of crimping fish from the Chinese; but ashamed to act as the Chinese do in this respect, they give the fish a tap on the head to stun it a little, and then make their cuts, which, according to Sir Anthony Carlisle and others, is useless, if the muscular fibres do not contract, that is, in truth, unless the fish is

killed by the transverse cuts; or more plainly, unless the exquisite gourmand sees or believes the poor fish evinces, or has evinced excruciating suffering, by the quivering of every portion of his mutilated body, his fastidiously pampered appetite is not gratified. Nine times out of ten the improvement is imaginary; for, as I have elsewhere observed, the fish which it is pretended by fishmongers to be in *reality crimped*, has been deprived of vitality for many hours before the transverse incisions are made.

One species of this last-mentioned genus inhabits holes in the perpendicular banks of some rivers, where they lie with their heads out, watching for their prey.

Another species of this genus is frequently found amongst wet grass, after heavy rain, erroneously supposed to come down with it, an explanation of which is before given.

Bola Coibor is a very beautiful fish, four feet long and upwards.

Bola Pama, four to five feet long, only goes up as high in the river as the tide reaches.

Silurus has a prickle, barbed, and a defensive weapon against any enemy except man; it has also apparently two vents.

I have looked carefully over the work of Dr. Hamilton for the fish mentioned in the article on fly-

fishing in the Ganges, by the name of marseer, but do not find one which bears that name, and I omitted to ask the gentleman with whom I conversed on the subject, the generic name of the fish.

A gentleman gave some curious particulars of a fish called the Cower fish of Bengal, in a newspaper; but it requires authentication.

Salmon are not known in the southern parts of the world, being for the most part natives of northern climes.

Mr. Dickens states that near the Indian Archipelago, the waters are said to contain a species of sea-snake, which it is certain death to handle.

William Ghislin, Esq., proprietor, editor, printer, and publisher of the "Cape Monitor," has favoured me with the following—

SYNOPSIS OF THE EDIBLE FISHES AT THE CAPE OF GOOD HOPE.*

TRIGLIDÆ.

1. Trigla Capensis. Cuvier and Valenciennes. (?) (*Roode Knorhaan, red Gurnard of the Colonists.*) Head, back, upper part of body, and fins rose red. Belly, silvery white, shaded by rosy patches. Scales, very small; lateral line, nearly parallel. Interior

* The author of the account of these fish was Dr. Pappe.

surface of the pectoral fins, dark yellowish green, with large black marks towards their bases, speckled with a number of pure white irregular spots. Iris, red. Length, twelve inches.

Baron Cuvier, in giving a very short diagnosis of this species, specimens of which were sent him from the Cape by Delalande, remarks, that "the dark spots at the inner surface of the pectoral fins were wanting;" but I have reason to believe that his specimens had faded, and that, through the effect of the spirits in which they were preserved, the natural colours had been more or less obliterated. Experience, and the accounts of the fishermen here, convince me that this and the following species are the only ones of the genus caught in our bays.

Cuvier's observation, that the fish bears a great resemblance to the *Trigla Kumu* of New Zealand, is perfectly correct. Flesh firm, but palatable. Caught in summer with the hook, but not very common in Table Bay.

2. Trigla Peronii. Cuv. and Val. (*Graanwe or bruine Knorhaan, Grey Gurnard.*) Head, large; forehead, sloping; body, declining in breadth towards the tail; muzzle, projecting; teeth, small, but numerous; upper mandible longest, divided into two lobes, and beset at its margin with five denticles. Two spines, unequal in length, are placed above each

eye, and a strong spine at each side of the occiput; opercular and scapular spines, pointed sharp. Anterior side of the first ray of the first dorsal fin, slightly serrated; the second and third rays of that fin longer than the remaining seven. Ridges of dorsal groove, armed with a row of twenty-four blunt denticulations. Pectoral fins, large, reaching beyond the vent; tail, lunated. Lateral line, smooth; scales, small, oval. Head, back, and side brownish grey, mottled with white spots; belly, pure white, mixed with purple; pectoral fins, olive green on the inner surface, edged with azure, and embellished by a large black mark, sprinkled with white and sky-blue dots; lower jaw, and part of the pectoral and caudal fins, pale red, tinged with yellow; iris, white, with aurora-red. Length, from seven to fourteen inches.

This species appears to be nearly related to *T. Lyra*, of Europe; and although it does not correspond in every particular with Cuvier's description, yet I think that it is the same fish which was anatomized by that prince of naturalists.

Not often caught in Table Bay; flesh equal to that of the preceding species.

SCORPŒNIDŒ.

3. Sebastes Capensis. Cuv. and Val.—(*Jacob Evertsen.*) Body, oblong, robust. Head, large, bony,

channelled above and between the eyes, and armed with spiny processes; gill covers and properculum strongly toothed at the margins. Eyes, very large, protruding from their sockets. Mouth, wide, gaping; lips, fleshy; teeth, crowded, paved small, sharp, and curved in both jaws. Soft rays of dorsal fin longest. Liver, unequally three-lobed; gall-bladder, of an oval form, and the pylorus provided with numerous cœcal appendages. Air-bladder, large. Tile-red, with shades of orange, white and yellowish-green; marked on the sides with a few flesh-coloured spots. Belly, white, tinged with orange. Palate and peritonæum, greyish white. Length, twelve to fifteen inches. Called *Jacob Evertsen*, after a Dutch captain, remarkable for a red face, and large projecting eyes.

This fish, though common to Table Bay almost at all seasons, is highly prized for its flesh by most colonists.

4. Sebastes Maculatus. Cuv. and Val. (*Sancord.*) Similar to the former, but shorter,—of a more slender form, and with eyes, neither projecting, nor mouth much gaping. Liver, rather large, three-lobed; gall bladder, narrow, and club-shaped; pylorus, without regular cœcal appendices, but surrounded by a glandular greasy mass. Natatory bladder wanting; palate and peritonœum, black. Snout, obtuse; teeth, criniform, arranged in a band around the inner

edge of both jaws. Upper part of body, tile-red, mingled with orange, and shaded with brown. Scales, with greenish-brown edges. Belly, white, clouded with orange, and tinged with yellow. Length, eight to twelve inches. Dorsal fin, dim tile-red, sprinkled with yellowish green irregular marks, and with darker chestnut brown spots at the base of the membranous portion of its first spiny rays. Hue of pectoral, anal, ventral, and caudal fins, orange, with carmine-red: the eight lower rays of the pectoral fins detached at top from their connecting membrane. Iris, yellow.

A very delicious fish, but not very common. Caught chiefly in winter. Dr. A. Smith, in his illustrated work on South African Zoology, has confounded this species with the former. Though in their general outlines closely related, both fishes are, however, easily discerned, not only by outward appearance, but yet more by their anatomical differences; the one having a swim-bladder, and the other not; and from the colour of the palate and peritonœum, which are white in the first species, but black in the second.

SCLÆNINÆ.

5. Sclæninæ Hololepidota. Cuv. and Val. (*Kabeljauw.*) Body, elongated, stout. Head, large, rounded, bony; mouth, moderately large; both man-

dibles armed in front with a row of strong, short pointed, cylindrical, hooked teeth; none on the palate. Dorsal fin divided by a deep notch; its soft rays longer than the spiny; caudal fin, truncate. Head, purplish blue, with aurora-red, mottled with yellow and green shades. Back and sides, above the lateral line, greenish blue, marbled with faint orange and purple; fins, often rose-red; lower part of the body, pale flesh-red, mixed with green, purple, and white.

A large fish, from two to three feet long. Common on the coast; caught with the hook and drag net. Is one of the staple fishes on the market, dried and salted like cod, and exported to the Mauritius and elsewhere. Its flesh, when young, is good, but firm and dry in adult individuals.

6. Otolithus Æquidens. Cuv. and Val. (*Geelbeck.*) Body, oblong; head, conical; mouth, middle-sized; lower jaw, pointed, longest. Teeth in both mandibles nearly alike, numerous, sharp, crooked, the anterior ones of the upper jaw largest. First dorsal fin, low, spiny; caudal, semilunated. Back and sides above thel ateral line, dull, bluish purple, intermixed with green and orange; upper surface of head, flushed with aurora-red; lower parts, silvery white, tinted with purple-grey; inside of mouth, gamboge-yellow. Hence the vernacular name Geelbeck (yellow mouth). Iris, orange. Clumsy, attaining a length

of three feet or more. Flesh dry, but fit for salting. Common along the whole coast, where it is caught abundantly with the hook or net. It forms an article of food for the poor and lazy, and it is also prepared for exportation.

7. Umbrinka Capensis. Mihi. N. SP. (*Baard-mannetje.*) Snout, obtuse, thick, truncate; lower jaw, shortest with a barbel; dorsal fins, distinct. Head, reddish brown, tinged with gold. Back and sides, ash-coloured on a silvery base. Lower jaw and belly, white, sprinkled with minute dark spots. Scales, large. Iris silvery. Measures from two to two and a half feet, and is reputed for its delicious flesh. Chiefly caught in False Bay, during summer.

8. Cheilodactylus Fasciatus. Cuv. and Val. (*Steenvisch.*) Body, oblong, spindle-shaped; head, small; lips, fleshy retractile, the upper one longest. Eyes, middle-sized, placed near the crown; mouth, small; teeth, velvety. The five last rays of the pectoral fins extended beyond their membrane, cartilaginous; second ray largest, being three inches long; the other three, shorter and shorter. Caudal fin, forked, scales large, almost quandrangular; seven longitudinal stripes covered with smaller scales, along the whole extent of the dorsal fin. Head, olive green, intermixed with orange; upper part of side, brimstone yellow, tinged with green, purple, and orange

Body, crossed by five or six irregular vertical, purplish brown bands. Belly, yellowish white, mottled with olive green. Mouth and pectoral fins, deep orange; the lengthened rays of the latter rose red, upper ones and tail variegated with purplish lines. All other fins yellowish green, with purplish brown stripes or blots. Iris, yellow. Length, thirteen, breadth, four and a half inches.

A good table fish, caught with the hook; not very abundant in Table Bay.

SPARIDÆ.

9. Sargus Hottentottus. A. Smith. (*Hangberger.*)

Body, broad, nearly ovate. Head, small, projecting in front; incisors, firm, trenchant, similar to the human. Colour, blackish brown, tinted with purple; back and sides, crossed by five broad black vertical bands; belly, silvery white. Length, about eighteen inches.

Common to Table Bay from June to August, and much in request, particularly at the time when it is with roe. It is also cured and pickled for economical purposes. From the circumstance of its being chiefly taken in deep water, near a place called *Hangberg* (over a hanging rock), it has received its present colonial name. It feeds on shell-fish, and is caught with the hook.

10. Sargus Capensis. A. Smith. (*Hottentot Fish.*)

Body, much resembling that of the former, but more attenuated at base, and destitute of any bands or vertical stripes. Head, purplish; back, dull, bluish green, with a metallic gloss; sides, beneath the longitudinal line, silvery, with a reddish tint. Iris, white.

Caught at all seasons with the hook, and is not only a superior table fish, but forms, when salted and dried, an article of exportation. Mostly confined to Table Bay and the West Coast, where it is found abundantly. Length, from twelve to fourteen inches.

11. Chrysophrys Globiceps. Cuv. and Val. (*Stompneus.*) Muzzle obtuse, body broad; teeth thick, firm, numerous. Back, bluish grey, with aurora red; belly, white, silvery. The younger individuals have three or four transversal bands, which disappear in the adults.

A favourite fish, and often caught in great abundance during summer, with the drag-net; it also makes an excellent pickle fish.

12. Chrysophrys Laticeps. Cuv. and Val.—(*Roode Steenbrassem.*)—Head, very large, gibbous; crown, elevated, broad, convex, tapering towards the snout; eyes, almost vertical; mouth, of a moderate size; muzzle pointed, but blunt; lips, fleshy; upper mandible armed in front with four large, strong, conical teeth, and the lower one with six, corresponding with

those of the upper; middle teeth smaller than the lateral. Rows of sharp-pointed teeth inside the mouth, followed by bands of round, granular molars. Soft rays of dorsal fin higher than the spiny; caudal nearly truncate. Scales, large. Liver, divided into two unequal lobes of an ochreous hue, and with the gall-bladder proportionally small: gullet, dilated into a big, strong, muscular stomach, of an oblong shape; pylorus, supplied with four short cœcums of different lengths. Swim-bladder, large, simple, and firm. Intestines a little longer than the whole fish. Head, faint purple with aurora red; back, dull greyish green; sides and belly, slightly flesh-red, on silvery ground. Groove between the maxillary and inter-maxillary bones, saffron yellow. Fins, reddish.

This bulky fish often exceeds 3½ feet in length, and fourteen inches in breadth. It is very voracious, and feeds generally on crabs and cuttle-fish. (Sepia and loligo.) As food it is much prized, and it is also cured for exportation. Not very common in Table Bay, but caught abundantly in False Bay, and on the shores of Hottentots' Holland.

13. Chrysophry's Cristiceps. Cuv. and Val. (?) (*Roman.*)—Body, of a beautiful orange colour, shaded by silver. Head and jaws, a deep orange hue. Between the eyes a falcated band of pure indigo blue, and a narrow stripe of the same colour running along

each side of the dorsal; a broad silvery line extends from the dorsal nearly to the anal fin. All fins crimson, with a shade of silver; iris, red. One of the prettiest and most delicious fishes on our markets. Its flesh is generally acknowledged to be a superior dish. It is common in the waters east of Table Bay, and especially near the *Roman Rock;* where it is caught with the hook and drag-net in great numbers. A strayed individual, caught in Table Bay, on the 14th of June, 1849, measured sixteen inches in length, and seven in breadth.

14. Chrysoblephus Gibbiceps. Swains. (*Baaische Roode Stompneus; Poeskop.*)—Head, very large, broader than the body. Front, obtuse, truncate; the profile almost vertical. Eyes, near the crown, which is elevated and gibbous; lateral line terminating at the lower side of the tail (Swainson). Mouth, middle-sized; teeth, strong. Back and sides, rose-red; lower parts, silvery. Length, one and a half to two feet. A large snow-white spot in front of the forehead enhances the beauty of this singular fish, which ranks amongst the choicest in this colony. It is rare in Table Bay, but frequently caught with the hook in False Bay, Mostert Bay, Fishoek, and in similar localities. It is also exported.

Pagrus Laniarius. Cuv. and Val. (*Daggerath.*) Front, higher than in *Chrysophrys*. Strong conical

teeth in the upper jaw, which are directed forwards, and projected from the mouth; the two outer teeth being longer and thicker than the rest, and those of the lower jaw much smaller. The whole of the fish is of a dark rose-colour, with a black spot at the insertion of the pectorals, and with another on the extremity of the dorsal fin. Lower jaw, white; iris, silvery; length, twelve inches. Highly prized for its delicious flesh. Not found in Table Bay; but frequently caught with the hook in the waters towards the east and south of Cape Town. This handsome fish owns its surname of *Laniarius* (butcher) both to its colour and to its sharp teeth and voracity.

16. Lithognathus Capensis. Swains. (*Blaauwe Kaapsche Steenbrassem.*)—Body, elongated, fusiform; head, lengthened, projecting; mouth, small, terminal; the maxillaries thick, enlarged, very hard; tail, slightly forked (Swainson). Back, dark marine-blue; belly, white, tinged with purple. Length, two and a half feet and upwards.

An excellent table fish, and very fit for pickling and salting. Caught with baited hooks, during summer; especially in Hout's Bay.

17. Pagellus Afer. Mihi. N. SP. (*Roode Kaapsche Stompneus*) Body, ovate, broad, somewhat compressed. Lower jaw, a little shorter than the upper one. Mouth, obtuse; front teeth, conical, stronger

and larger than those within, both jaws paved internally with two rows of round molars. Lateral line, well marked. Head and back, aurora-red, mottled with blue and gold, on a silvery ground. Sides of the body crossed by five or six sky-blue broken longitudinal stripes. Lower mandible and belly, white. All fins faintly rose-red; apex of the tail, orange. Iris, purplish. Length, twelve to fourteen inches. Dorsal, $\frac{11}{12}$. Anal, $\frac{2}{8}$. Caudal, 11. Pectoral, 15. Ventral, $\frac{1}{5}$. One of the best fishes in the market. Its flesh is white and delicious. Superficially examined, it bears some resemblance to the Cape silver-fish (*dentex argyrozona*), from which it is easily distinguished, not only by its broader form, and less vivid hue; but also, by the absence of the six rose-red longitudinal bands, and by the formation of its teeth. Caught with the hook during winter, and pretty common on the market.

18. Dentex Rupestris. Cuv. and Val. (*Bastard Silverfish; seventy-four.*) Body, large, bulky; teeth of the outer row, large, cylindrical, curved and pointed; the four front ones of its jaws strongest. Scales, large; lateral line, broken. Back and sides, above the lateral line, aurora-red, clouded by ultramarine, blue, green, and faint purple, with an orange tint towards the tail. Lower parts of the body,

aurora-red tinged with orange, and shaded with ultramarine blue. (A. Smith.) Length, about three feet.

Rarely found in Table Bay; but considered one of the very finest fishes in the colony. It is chiefly confined to the east of the Cape, where it is caught with the hook, or net, in great abundance. It is also cured for foreign markets.

19. Dentex Argyrozona. Cuv. and Val.—(*Silver-fish.*)—Body, oblong; eyes, large; mouth of a moderate size; teeth, like those of the preceding species. Head, back, and sides, above the lateral line, aurora-red on a silvery base; hue, below that line, faint flesh-red, striped with five or six narrow, longitudinal pale, rose-red bands. Belly, white, silvery; fins, purplish-red; iris, scarlet. Length, from sixteen to twenty inches. This very voracious fish feeds principally on small fish and crabs. It is common on the Cape market throughout the year, and forms also an article of export.

20. Cantharus Blochii. Cuv. and Val. (?)—(*Windtoy.*)—Body, broad, oval; head tapering towards the muzzle, and forming a curvature above the eyes. Jaws, free, somewhat protractile. Anterior teeth, small, but sharp; inner rows, velvetty. Spines of dorsal fin, strong, spiny; pectoral fins, round at base and pointed at the apex; scales, middle-sized. Tail, unequal, upper side longest. Length, twelve inches;

breadth, nearly five inches. D., $\frac{11}{18}$; A., $\frac{3}{12}$; P., V., $\frac{1}{8}$; C. 17. Head and back, olive-green; sides silvery, with a faint rosy gloss; fins pale rose-red. Pectoral fins with a black spot at their insertion. Iris, silvery.

A delicious table-fish; more commonly caught in winter, and often put up in bundles along with sargus capensis (Hottentot fish), from which it is easily distinguished by a very superficial examination.

21. Cantharus Emarginatus. Cuv. and Val. (*Dasje.*) Body, lanzeolate; front roundish, with a curvature hardly perceptible; muzzle pointed, and partly concealed beneath the suberbital bone, which has a deep emargination in front of the eyes; front teeth small, but crowded, pointed, and sharp; scales, minute; lateral line, moderately bent and well marked. D., $\frac{11}{12}$; A., $\frac{3}{10}$; V., 5; P., 15; C., 17. Head, back, and sides faint brown, on a silvery ground; a greenish blue metallic lustre above and in front of the eyes; body, striped with some narrow yellowish, longitudinal bands; pectoral fins, with a dark spot at their base; abdomen, white, tinged with light brown. Length, twelve to fourteen inches.

Rare in Table Bay, but more frequently caught in the several bays to the east of the Cape. Its flesh is highly esteemed as food.

22. Boops Salpa. Cuv. and Val. (*Bamboesvisch, Stinkvisch.*) Body, subovate, attenuated at both

ends; mouth, small, obtuse, not protractile; external teeth, broad, trenchant; scales, minute. Head, olive green, with a flash of gold; body, silvery, with eight to ten longitudinal golden stripes; iris, yellow; a black speck at the base of the pectoral fin. Length, twelve inches or more.

The fish feeds only on *algæ*, and is caught principally in localities where there is an abundance of sea-weed. Amongst the latter, the Ecklonia Buccinalis (*Leebamboes*), and our large Sargassa (*S. longifolium* and *S. integrifolium*), are its usual haunts, and hence the vernacular name of *bamboo-fish*. On account of its vegetable nourishment, it exhibits at times a particular smell, when embowelled, and is for that reason called *stink-fish* by some of the fishermen. It is a rich and delicate fish, and though scarce on the Cape Town market, is common in Saldanha Bay, where it is salted and dried for home consumption.

SQUAMIPENNES.

23. Pimelepterus Fuscus. Cuv. and Val. (*Bastard Jacob Evertson.*) Body, oblong, bulky; head, small; snout, obtuse; teeth, strong, cutting, singularly ranged in one row; eyes, large, protruding; fins, thick, covered by scales, whence the scientific name (fat-fin). Two dorsal fins, united at base. Length, two feet.

This fish is of an uniform dusky brown colour. Its flesh is well flavoured, and very nice. Caught chiefly in Simon's Bay, and along the east coast. Feeds on shell-fish.

24. Dipterodon Capensis. Cuv. and Val. (*Galjoen-visch, Galleon-fish.*) Body, oval; outer teeth, strong, large, trenchant, resembling those of *Sargus;* lips, fleshy; mouth, proportionally small. Two dorsal fins, the second, as well as the anal, and part of the caudal, thick, covered by very minute scales. Head, back, and fins, ash-coloured grey, or faint brown; sides, with six silvery vertical bands reaching the middle of the belly, which is silvery white, and tinged with purplish red. Length, from fifteen to twenty inches.

This fish, more plentiful in the western division of the colony, is highly esteemed as food, and always fetches a good price. It is, however, disliked by some, on account of the many black veins traversing its flesh, and is at times rather unwholesome, from being too rich, and requiring good digestive organs. It is caught with the drag-net during summer.

SCOMBERIDÆ.

25. Scomber Capensis. Cuv. and Val. (*Halfeord.*) Body, oblong, adipose; muzzle, obtuse; lower jaw, somewhat projecting; teeth, numerous, small, vel-

vety. First dorsal fin, spiny, connected by a membrane; second dorsal, longer than the anal; pectoral and ventral fins equally long; caudal, forked. The lateral line is bent at the upper part of the body, but becomes straight towards its end. Head, back, and sides dark marine blue, with a broad greenish yellow streak, running from eye to tail, which latter is crested; abdomen, white, silvery; fins, yellowish green; iris, white.

A large fish, measuring from two to three feet. It is rather uncommon in Table Bay, but taken with the hook occasionally. Its flesh being very rich, and deemed unwholesome, it is not in much request, and is therefore chiefly used as pickle fish.

26. Scomber Grex. Mitchill. (*Mackerel.*) Body, oblong, rounded, fat, smooth, covered with minute scales; teeth, small; dorsal fins, two; caudal fin, deeply forked; tail, bearing finlets; its sides not carinated at base. Form and colour much like that of the common mackerel. Body and sides, light green, with darker stripes of the same hue. Length, about eighteen inches and upwards.

This species, which is caught with the line, is little liked, on account of its greasiness. It is common in Table Bay during winter, and is chiefly pickled.

27. Thyrsites Atun. Cuv. and Val. (*Snook, Snoek.*) Body, cylindrical, elongated; jaws, protracted, the

lower one longest; mouth, wide; teeth, large, conical, trenchant, sharp, the palate set with smaller ones. First dorsal fin very long, tail without a lateral keel; skin, rather naked. Back, blackish blue, with metallic lustre; sides and belly, silvery. Length, often exceeding three feet.

This voracious fish is caught with the hook in immense numbers almost all the year round, but more frequently during summer. It is very strong and ferocious, and is despatched, after being pulled on board, by blows on the head, with a kind of knob-kierie. Its flesh is highly prized by the majority of the colonists, who also salt and dry it for home consumption, and as an article of trade.

28. Lichia Amia. Cuv. and Val. (*Leervisch.*) Body, compressed, oval, nearly rhomboid; broadest in the middle, and attenuated at both ends; mouth, moderately large; jaws, of equal length; front teeth in a number of rows, small, but sharply pointed, and closely set; a line of large teeth on each side of the palate. Dorsal fins, two, first one with eight detached prickles, the foremost of which is turned forward; anal fin shorter than the dorsal; tail without lateral keels. Head, back, and upper parts of the sides, steel blue, lower parts silvery, shaded with faint brown; fins, yellowish; belly, pure white. Length, from two to three feet.

Taken occasionally in Table Bay, but not in great repute, its flesh being deemed dry and rather insipid.

29. Temnodon Saltator. Cuv. (*Elftvisch.*) Body, oblong, slightly compressed; mouth, large; lower jaw longest; both mandibles armed in front with detached trenchant, pointed, sharp teeth, and within and behind with smaller ones. Dorsal fins, two; first smaller and lower than the second, its rays jointed by a delicate membrane; tail, destitute of a lateral keel and spurious fins. Length, about two feet.

This fish is uniformly lead-coloured, shaded with dark green on its back. From leaping now and then out of the water, it has obtained its name of Saltator (jumper). It is held in great esteem as a table fish, and the younger individuals are truly deemed a dainty. It is often caught in Table Bay, particularly in summer.

30. Caranx Trachurus Lacep. (*Maasbanker; Bastard Mackerel.*) Body, spindle-shaped, broad, compressed; each jaw with a row of straight minute teeth; lateral line armed with scaly, carinated, prickly bands; dorsal fins, two; first, low and small; pectoral fins, long, falcated; two detached spines before the anal fin; scales, minute. Upper part of the body of a bluish lead-coloured hue; lower parts, silvery white; iris, gilt. Length, twelve to eighteen inches.

Caught in winter at both ends of the colony; its flesh is well flavoured and wholesome.

31. Stromateus Capensis. Mihi. N. Sp. (*Katunkar.*) Body, compressed, oblong rhomboid; head, obtuse; mouth, small, not projectile; teeth, velvety. One dorsal only, covered with epidermis; no ventral fin; caudal nearly as long as the dorsal; tail, forked scales, small; longitudinal line almost straight. Head, olive green; upper part of the body light blue, with some faint yellow longitudinal stripes; belly, silvery, with a red tint; iris, white. The specimen from which this description is drawn, measured thirteen inches long, and five and a-half inches broad.

A good table fish, but not common. It is caught with the hook and net, chiefly east of Table Bay.

32. Lepidopus Argyreus. Cuv. and Vat.—(*Kalkvisch, Scabbard-fish.*)—Body, compressed, lengthened, narrow, riband-like; skin smooth. Head pointed, bearing a great resemblance to that of the snook. Mouth, gaping, large, armed with rows of strong trenchant teeth, and four larger ones in front; underjaw projecting beyond the upper. Dorsal fin, low and equal, nearly as long as the back; pectoral fins, small, hooked; two round scales as rudiments of a ventral fin. Anal fin, short; caudal, small, forked. Lateral line, straight. Colour of back faint steel blue on a silvery ground; the whole surface of the body

clothed with a silvery dust. Length, five feet; breadth, from three to four inches.

This curious fish swims in undulating motions and with astounding velocity. It is but very rarely caught in the net. In the course of six years, not more than three individuals, to my knowledge, were taken in Table Bay. I found its flesh fine and delicious.

MUGILLIDÆ.

33. Mugil Capensis. Cuv. and Val. — (*Harder*; *Mullet.*) Body, oblong, nearly cylindrical, robust. Head, small, broad, flat; muzzle, short, blunt: lower jaw with a depression, corresponding to a prominence in the upper one. Superior mandible provided with a row of fine diminutive teeth. Scales rather large. Dorsal fins, two, remote from each other; first with four spiny rays; pectoral fins pointed; caudal, forked. Surface of head and back, dark steel blue, mingled with oil green; sides, beneath the lateral line, greyish white, on silvery ground; cheeks, lower jaw, belly, and ventral fin, white. Fins, greyish green. Body, crossed by nine narrow longitudinal lines. Interior of the mouth, pure white; iris, silvery. Length, fourteen inches; breadth, nearly four inches.

This species, as well as the following, enters the mouths of several rivers. Nursed in ponds, it grows

extremely fat, and attains an uncommon size. A specimen so fed measured nineteen inches.

34. Mugil Mutilineatus. A. Smith. (?) (*Springer; Leaping Mullet.*) Greatly resembling the former, but easily distinguishable; its head being neither so broad nor flat, but rather a little convex on its top. Lower jaw more rounded; and body traversed by thirteen longitudinal narrow stripes. Colour of back and upper side, greenish brown; crown of head faint purple with oil green. Gill covers, tinted with gold; ventral fin, purplish. Lower part of belly, greyish white on a silvery base. Length, twelve inches. It is in the habit of leaping constantly, and with considerable velocity, when it finds itself entangled in a net; and hence its name.

Besides the two kinds of mullet here described, there are three or four more species recorded as inhabitants of the bays and rivers of the colony. All of them are caught with the net. They make good table fish, but are more frequently salted or smoke-dried (Bokkours) like the herring; and thus preserved, form a very considerable article of home consumption as well as of export.

BLENNIDÆ.

35. Blennius Versicolor. Mihi. N. Sp.—(*Klipvisch.*) — Body, elongated, smooth, slimy, spindle-

shaped; head, thick, obtuse; forehead, tapering towards the snout. Muzzle, short, truncate; mouth small; lips, fleshy; teeth in several rows; those of the first, strong. pointed, conic, hooked; inner ones, small paved. Dorsal fin nearly as long as the body, commencing right over the crown of the head; its first three rays longest, spiny, separated from the soft ones by a deep emargination. Ventral, placed before the pectoral fins, and consist of only two rays. A small tentaculary, three-fid appendage above each eye-brow; and a tubercular excrescence near the anus, in both sexes. It is ovoviviparous. No fish perhaps displays a greater diversity of hues than this; and to make out any *specific difference* amongst its many varieties, is next to impossible. I am thus inclined to unite them under *one* common denomination, expressive at once of the changeable character of their colours. The following are the chief varieties observed by me in fresh specimens.

1. Prevailing colour, blood red, mottled with greyish white irregular blots; abdomen, purplish on a white ground; fins, deep red, tinged with greyish green. Iris, purple. Length, twelve inches. Caught principally amongst the rocks of Robben Island.

2. Head, back, and sides, dark purple, marbled with reddish brown, flesh-red, orange, and pale yellow marks. Belly, white, shaded with purple.

Pectoral rays striped with purplish brown bands; dorsal, caudal, and anal fins, dull brown, spotted with yellowish green dots. Iris, purple. Length, ten to twelve inches. Blennius Rubescens. Lichtenst. (?) Extremely pretty; caught along with the former.

3. Upper part of the body, pale yellowish brown; head, olive green; sides and belly, gamboge yellow, sprinkled with irregular greenish white marks; pectoral and caudal fins, without bands; dorsal and anal, with faint green spots. Iris, yellow. Length, eight to ten inches.

4. The whole of back, sides, and fins, olive green; belly, of a deeper yellow tint, with some white blots along the lateral line. Iris, yellow. Length, six to eight inches.

The klipfish is greatly reputed for its flesh, which is nice, well-flavoured, and wholesome.

SILURINÆ.

36. Bagrus Capensis. A. Smith. (*Bagger.*)—Body oblong, thick, smooth, slimy; head, large, broad, nearly flat above; muzzle, round, blunt; upper lip fleshy, with a barbel on both sides; teeth, crowded, velvetty; chin, supplied with four barbels, which are shorter than those of the upper jaw. Dorsal fins two; second flat, fleshy, smaller than the first: pectoral fins, moderate; anal large; caudal, deeply

forked. Upper part of head, back, and sides, dark greenish brown; lower parts, shaded irregularly with blue, yellow, and silver, and flashed with a bronzy lustre. Belly, dull greyish-white, speckled with small brown dots, and clouded with purple. Base of tail, red; fins, faintly flesh-coloured. Iris, yellow. Length, twelve to sixteen inches.

Owing to its ugliness, this curious fish, which hides itself amongst stones in muddy water, the better to entrap its unsuspecting prey, is, from popular prejudice, less prized than it deserves. Its flesh is extremely delicate, and bears a greater resemblance to that of the eel than that of any other sea-fish caught in the colony.

CLUPEIDÆ.

37 Clupea Ocellata. Mihi. N.Sp. (*Shad; Sardyn.*) —Body, compressed, elongated; head, flattened at top; muzzle, obtuse; upper jaw, with a central notch, and a little projecting. No teeth in either mandible; eyes and scales, large. One dorsal only; tail, deeply forked. Length, six to seven inches. Head and back, blue, changeable to green, and shaded with purple, yellow, and gold. Lower jaw and gill covers, silvery, with a reflecting golden lustre; sides, above the lateral line, crossed by a sky-blue longitudinal stripe. A line of eight to fifteen round,

black, eye-like spots, extends from the upper edge f the operculum, along the whole body. Belly, silvery; iris, gilt.

It would appear that this species stands intermediate between the common shad (*clupea alosa*) and the Twaite shad (*clupea finta*), possessing the toothless mouth of the former, but the size and colouring of the latter. Its natural length never exceeds six to seven inches. It is caught with a net, and used occasionally as pickle-fish.

38. Engraulus Encrasiolus. Flem. (*Ansjovis: Anchovy.*)—Body, slender; head and snout, pointed; upper jaw projecting considerably. Mouth, deeply and horizontally cleft far behind the eyes. Maxillaries and palate, armed with small, but sharp numerous teeth. Scales, large and deciduous; tail, deeply forked. Top of head and back, blue, with a tinge of green; flanks and belly, silvery. Fins, greenish white. Length, four to five inches.

Caught sometimes abundantly, with the net, in summer, but little used in the colony; the Cape salt being found unfit for its preservation as a condiment.

GADIDÆ.

39. Gadus Merluccius. Linn. (*Stokvisch: Hake.*)—Body, elongated, slender; head, broad, depressed. Lower mandible protruding beyond the upper one;

mouth, very wide; teeth, long, sharp, in a single row in each jaw. Two dorsal fins, first three angular; caudal fin, lunate; ventral, ovate, with five rays. No barbel under the chin. Scales, large. Upper part of the body, dusky brown, with a bluish, steel-coloured gloss; belly, dirty white. Iris, yellow. Inside of mouth, black. Length, from two to three feet.

It is remarkable that this fish, a notorious denizen of the European seas, was utterly unknown at the Cape of Good Hope before the earthquake of 1809 (4th December). At first it was scarce, and sold at exorbitant prices, 4*s*. 6*d*. Since that period, it has yearly increased in numbers, and is now a standard fish on the market, being caught in great abundance.

English writers on Ichthyology comment very unfavourably on its merits, and call it a coarse fish, scarcely fit for the dinner table. At the Cape, its qualities are generally and fully appreciated; in fact, its flesh is highly delicate, and but little inferior to that of the Hadok (*Gadus Æglefinus*). At times, it makes its appearance in large shoals; it is then abundantly caught, salted, and dried for exportation. The cured, or dried Cape Stock-visch, is an excellent dish, far superior to that insipid stuff introduced from Holland or other countries.

XIPHIURIDÆ.

40. Xiphiurus Capensis. A. Smith. (*Koningklip-visch: King's Rock Fish.*) Body almost cylindrical, moderately robust. Head, large; two rows of larger teeth in the upper, one of smaller ones in the lower, jaw; vomer, armed with teeth of the same description. Two barbels pending from the under surface of the lower mandible. Pectoral fins of an oval form; dorsal, caudal, and anal fins, united. Tail, narrow, tapering, compressed, sword-shaped. Ventral fins, none. Scales, very small (A. Smith). Has a large, and very firm air bladder, flesh coloured, and clouded by a variety and intermixture of hues, difficult to describe. Lower surface, belly, and point of tail, tinted with pale purple.

This fish, in some respects, seems closely allied to the family of the Gadidæ, while on the other hand it somewhat resembles the Murænidæ. Although its habitat is deep water, and not (as its name implies) amongst cliffs and rocks, yet it justly deserves the title of King's Fish, being, without exception, the most desirable fish obtainable in our bays. It is rather scarce, is an expert swimmer, appears on the coast as a harbinger of rough, stormy weather during winter; and commonly sells at very remunerating prices.

Dr. Andrew Smith, the intelligent South African traveller, gave the first description of this fish in his

admirable "Illustrations of the Zoology of South Africa." It was, however, known previously to Barrow, 1797, who, in his Travels (page 30), mentions it in the following terms: "Another Blennius, called King's Rock Fish, is sometimes caught in Table Bay, to which, from its resemblance to the Muræna of the ancients, naturalists have given the specific name of Muræenoides."

I quote this passage for the purpose of contradicting Dr. Smith, who says, that during one of the several earthquakes which occurred many years ago, at the Cape, one or more sand banks were formed near the entrance of Table Bay, and that not long after, the first specimens of this fish were obtained." It is evident that by some mistake or other, he attributed to the Xiphiurus what applies to the Stock-visch.

PLEURONECTIDÆ.

41. Solea Vulgarus. Cuv. (*Tong; Sole.*) Body oblong, flat, pointing towards the tail; snout, arcuated, projecting beyond the mouth, which is fringed below with small ciliated scales. Jaws unequal, armed, on the under or white side only, with very minute, crowded teeth; eyes, small, spherical, placed near each other, on the upper or coloured side. Dorsal and anal fins extending as far as the tail; ventral fins near the head; tail slightly rounded; lateral line straight. Length, ten or fifteen inches. Upper

surface, olivaceous brown, obscurely spotted with patches of a deeper hue. Scales, small, roundish, ciliated, rough to the touch; the upper side, apparently reticulated. Fins, tipped with purplish brown stripes. Lower side, dull white, mixed with faint purple. Iris, yellow.

It is hardly required to say much of this almost cosmopolitical fish, which is, for its delicacy, prized as well at the Cape as elsewhere. It is not common, however, in the colony, and it rarely surpasses the length of twelve inches, although there are instances known of individuals measuring a foot and a half.

RAIDÆ.

42. Rhinobatus Annalatus. A. Smith. (*Zaudkruiper.*) Body convex above, level below, tapering from head to tail. Head, flat, nearly three-sided; eyes small; teeth, crowded, paved, blunt; clusters of small thorns between the eyes, and minute spines along the dorsal line. Dorsal fins, two close to the caudal, which is oval; ventral fins, small; skin, rough, like shagreen. Length, two feet and upwards. Upper side, yellowish grey, with a greenish shade, sprinkled all over with white eye-like spots; under-surface, faint flesh-red, bordered with white. This fish, which always dwells in localities where the bottom of the sea is level and sandy, is rather scarce in Table Bay. Its flesh is tender and delicate.

43. Raia Maculata. Montag. (*Rog ; Scate ; Spotted Ray.*) Body, rhomboid, horizontally flat on both sides; snout narrow, pointed, blunt; mouth, nostrils, and gills on the under surface of the body. Teeth, in many rows in both jaws, sharp, pointed, conical, and curved in the male; paved, broad, and flat in the female. Tail long, thin, three-sided, furnished all along its edges with three lines of strong, hooked, but irregular spines, and with two small dorsal fins towards its end. Both surfaces more or less smooth, but snout and upper margin of the large pectoral fins armed with clusters of hooked spines in the male, and with curved, tubercular denticles in the female. Male, provided with cylindrical, cartilaginous appendages (claspers) to its ventural fin. Female larger than the male. Length, two and a half feet and more. Colour above, pale yellowish brown, sprinkled with numerous irregular, faint, bluish grey spots. Under-surface, somewhat rough, greyish white, tinged with purple.

A good table fish, and a forerunner of bad weather. It is caught with the net.

To the number of edible fishes enumerated here, I feel bound to add one which I never saw, but which I introduce on the incontestable authority of Dr. A. Smith, who has given the following description of it in the first volume of the "South African Quarterly

Journal," (1830); a publication full of interesting and useful information respecting the Cape Colony.

44. SERANUS CUVIERII. A. Smith. (*Rock Cod.*) Colour of the back and sides, brownish yellow with blotches, streaks of irregular bands of dusky, greenish black; lower part of sides and belly, reddish yellow, with slight mixture of brown. Dorsal fins, deep, dusky brown, with the extremities of the spinous rays reddish; ventral fins towards apices, brown; towards bases, yellow; bases of pectoral fins bluish white, finely spotted with orange; rest, reddish brown. Tail even, or only very slightly rounded, with the hinder edge narrowly marginated with white. Eyes, orange.

A full-grown specimen of this fish measures about two and a half feet. It inhabits the ocean along the east coast of Africa, particularly about Algoa Bay, where it is frequently caught, and highly esteemed as an article of food.

This synopsis appeared at different days in the Cape Monitor. The fish here described, are no doubt very beautiful; and coloured plates of them would, if equally well performed, serve as a companion to the "Fishes of Ceylon," by the late John Whitchurch Bennett, Esq.

FISHES OF ALGERIA.—The coast of Algeria pro-

duces an abundance of fishes, viz., the flying-fish, the hammer-headed shark, and phoca, or sea wolf, similar to those on the other side of the Mediterranean. Barbel and eels are the most common river-fish. In the warm springs of Capsa, are beautiful small perch, with chequered fins, and turn-up nose. Large shoals of circular flat polypi, with a semicircular ridge obliquely across the back, frequent the coast. Lamping relates, that many soldiers were lost in bathing at Dschidgeli, through being sucked under by these monsters. They are quite surrounded by small suckers, and are eagerly pursued by tunnies and porpoises.—"Algeria," by John Reynel. Morell, 1854, p. 485.

The lakes and rivers of North America yield an abundant supply of excellent fish, as well as aquatic wild fowl. The only lake, in the great chain of lakes, in which fish are found that migrate to the sea, such as salmon, is Lake Ontario; the Falls of Niagara proving an insurmountable obstacle to these fish visiting the other lakes. The fish of these lakes are of numerous species; amongst them, particularly in the Detroit River, there is the grey or salmon-trout, black and rock bass, a few white and striped bass, pickerel, pike, and fresh-water herrings; some of the outlets of the lake have many sturgeon, but in general the flesh of it is but little esteemed.

There is also a species of pike, called the muskanunger, which grows to a large size, and is considered

by many an excellent fish. In the very small lakes, the grey or salmon-trout does not exceed four or five pounds; but in the large lakes it is sometimes found of the weight of thirty, or even forty pounds.

I have, within this day or two, purchased "Adventures of an Angler in Canada, Nova Scotia, and the United States," by Charles Lanman. I have not time to make extracts from this work; but it tells of taking one hundred and sixty trout in an afternoon, single-handed, and of himself and two others taking seven hundred of the same kind of fish in one day; such great sport in salmon fishing, spearing pike, and other sporting adventures, that it is enough to induce a sportsman to take the voyage, in the hope of enjoying the same kind of exciting, healthful amusement.

I did not set out with the intention or promise of giving minute instructions as to the manner of angling generally, because there are so many excellent works already upon the subject; all I proposed to perform in that way is, to communicate the observations I have made during the course of a long, and healthy life, with which a beneficent Providence has blessed me. And I trust the brief anatomical, and physiological observations I have made, and referred to, may stimulate others to follow up the very interesting subject, and further enlighten the world as to the wonderful arrangement of the organisation, habits, and probable reasoning powers of aqueous animals.

It is useless to catch fish, unless they can be cooked properly, so as to make them palatable and wholesome food; therefore, as cookery is only domestic chemistry, I shall not feel it derogatory, to give a few directions for the proper preparation of several kinds of fish for the table, probably some of them different from methods before known.

All fish should be killed the moment they are taken out of the water, not only on account of the inhumanity of allowing them to linger in an element uncongenial to their nature, but also allowing them to die by slow degrees, renders them less valuable, nourishing, and conducive to health as food. E. Jesse, Esq., in his work, "Anglers' Rambles," says he always has a large knife, with a hammer at the end to kill fish as soon as they are taken. He was so polite, at my request, as to refer me to the cutler who made it; but the knife was large, consequently heavy, and the price high. I have had one made very neat, and lighter, at less than a quarter the price, and the blow of the hammer on the skull of the fish kills it instantly. Eels, I am informed, can be instantly killed by a longitudinal division of the spine, at the back of the head; my knife will perform that, yet I think a blow of the hammer on the middle of the head, as with other fish, would accelerate the object.

Pike are said to be best flavoured when from eight

to twelve pounds weight, but I once partook of one, which a friend of mine had caught, weighing twenty pounds; it was roasted, with rich gravy for sauce, and was excellent.

Pike are called jack until they attain the weight of four pounds. They are said to increase in weight four pounds a year, till they attain about eight pounds, when they gradually decrease in growth to two pounds a-year; when five years old, they will eat their own weight in gudgeons. One was taken in 1497, near Mainheim, which was proved to be two hundred and thirty-five years old, by a plate attached to him; he weighed three hundred and fifty pounds, and measured nineteen feet. His skeleton was long preserved.

To Boil a Pike.—Open and cleanse him, rub the inside with a little salt, dissolved in port or claret wine, save the blood if you can, cut him across into two or three pieces; place in the fish kettle as much cold water as you require, over a *very good fire,* and, say for a twelve-pound fish, a large handful of salt, a good quantity of sweet marjoram, savory, and thyme; let these boil, and whilst in a state of extreme ebullition, put in the smallest piece of the fish, and make the water boil up again before you put in the next smallest piece, and so progressively of the rest; boil half an hour. Sauce, fresh butter melted in the usual way, anchovies, claret, or port wine, a little of the

blood, if any saved, eschalot, and lemon juice, beaten well together; serve all hot; garnish with scraped horse-radish.

To Boil a Salmon.—Let it be crimped as soon after all sensation is destroyed as possible, by a blow on the head; or if cut into slices, and cooked the same way as the pike, it is excellent. In every case of boiling fish there should be plenty of salt in the water, as it enables the liquid to attain a higher degree of heat, and the albuminous particles are instantly solidified.

To Roast a Pike.—Let the fish soak, so that the scales will come off easily, wash and wipe the inside quite dry; take beef suet, shred and chopped fine, grated bread, of each a pound, if it be a good-sized fish, or in proportion accordingly; season with pepper, salt, grated nutmeg, fresh lemon peel, thyme, winter savory, the flesh of three or four anchovies, all chopped very fine, and mixed with the bread and suet, and made into a pudding with the yolks of three or four eggs; fill the belly of the fish, sew it up, roast in a cradle spit before a clear fire, not too near, keep it well basted with fresh butter; when the skin cracks it is done.

Sauce.—Rich gravy, one pint; stewed oysters, cut small, one pint; picked shrimps, and small pickled mushrooms cut small, of each half a pint; quarter of a pound of fresh butter, melted; half a pint of white

wine; mix all well, place the pike in a dish, pour the sauce over, serve it up hot, garnished with small pickled mushrooms.

A barbel may be cooked the same way; or either fish may be baked.

Another method to cook a Pike (called Braising).—Take a large pike, scale and cleanse it thoroughly, raise the skin on one side without spoiling the flesh, lard it with equal quantities of anchovies, pickled gherkins, carrots, and truffles, stuff it with the same ingredients, or the stuffing for fowls or veal; put it into a braising stew-pan, with a pint of rich gravy; baste it often whilst over a very slow fire, and when more than half done, put on the cover, and fire on it; serve with this sauce—mince some ham with the same quantity of truffles, put them into a stew-pan with a piece of butter, over a slow fire, let them simmer a quarter of an hour, add quarter of a pint of white wine and a pint of calves' foot jelly, the whites of two eggs boiled hard and minced small, and the yolks of four eggs boiled hard and rubbed down smooth with the wine as above, and a quantity of small pickled mushrooms equal to the ham and truffles, and one lobster's tail, all minced small, with the spawn; take up the fish, pour the sauce hot over it, garnish with scraped horse-radish.

A barbel or large eel may be cooked in the same

way; but be very particular to eradicate from the inside of the former fish every particle of the roe, or it will produce alarming illness. I never have the roe of pike cooked.

To Collar large Eels.—Skin and bone two large ones, put inside of them powdered mace, grated nutmeg, eschalots chopped fine, parsley, thyme, sweet marjoram, salt, and pepper, roll all up together so as to make a round ball, flat at the ends or collars, sew each eel in a separate cloth, put them into a stewpan with a pint of veal stock, half a pint of white wine, and quarter of a pint of vinegar; let them simmer three-quarters of an hour, place them in a dish till perfectly cold. Next take the liquor they were simmered in, strain it through a fine cloth, put by till cold, then take off all the fat, simmer it with the whites of two eggs to clarify it, strain again, and boil until it is a thick jelly; remove the cloth from the eels, place them in a deep dish, and when the jelly is nearly cold pour it over them.

All eels are more wholesome, if skinned before being cooked.

The three methods of cooking pike were communicated to me when I resided in France, by a French lady, who had cod and other fish cooked in the same way, as the first and third, and mackerel the same as the second.

Mr. Frederick Accum, the well-known scientific chemist, gave the following recipe for potting lobster.—Let the lobster be properly boiled, pick out the meat and eggs from the shell, season with powdered mace, cloves, nutmeg, pepper, and salt, he says anchovy liquor, *I say, three picked anchovies to each lobster*, pound all together in a marble mortar, add one quarter of a pound of *fresh* butter, mix all very well, press it into pots, cover with, he says, melted butter, I say, *with clarified melted mutton suet*, cover with paper when the suet is cold, and keep in a dry place, or put it into pots with a cover; keep out the air by placing a strip of gummed paper round the joint."

Crayfish, crabs, prawns, shrimps, and bloater herrings, may all be prepared in the same way; and I am told cold boiled salmon is also excellent, when prepared in this manner.

The Jews eat much fish; but we are very little acquainted with their methods of cookery. The following recipe for cooking large plaice, was given to me by a very superior female of that creed.

Boil three or four large onions until they are done, but not so much as to be too soft; strain off the water and slice the onions. Cut the fish into pieces, being first well cleansed; put at the bottom of a stew pan a little ginger in powder, pepper, salt, and hay-saffron, dried and powdered; place the fish on these, pour in

fresh water enough barely to cover the fish; place the sliced onions over the fish, put on the lid and let it simmer very gently till the fish is done; meantime take the yolks of four eggs, beat up, a good quantity of parsley chopped very fine, add to these a little of the liquor the fish was simmered in, beat all well together; and as the mixing goes on, add the juice of two lemons, previously squeezed out and strained very gradually, or it will cause the egg to curdle. Take up the fish with the onions upon it, in a deep dish, and pour the mixture of egg, lemon-juice, &c., over it; this they eat cold for breakfast—it will keep good a week. The quantities here are for two moderate-sized diamond plaice.

To dress a brace of Carp.—Kill the carp, scale and cleanse them immediately; save the blood, and if they are tolerably large, take a quart of claret or port wine, a pint of veal or beef stock, six cloves, one nutmeg sliced, a piece of cinnamon broken-up, a small quantity of pepper and salt, a good-sized sprig of thyme, and sweet marjoram, one onion, two or three pieces of fresh lemon-peel; put these, with the blood, all into a stew-pan, without the fish; cover close, and as soon as it simmers put in the carp and cover again; place the stew-pan on a *very clear slow* fire, so as only to *simmer;* when the skin of the carp begins to crack, take out the fish, and keep it hot. Then

strain the liquor, and have ready half a pint of stewed oysters, half a pint of picked shrimps, half a pint of very small white pickled mushrooms, strained from the vinegar; add these to the wine, &c., in which the fish was boiled; let them stew a little while, serve the whole quite hot in a proper dish. A little Chili vinegar may be added by those who like it.

Tench are cooked advantageously by the same process.

Eels may be stewed in the same way; only that you require less liquid, and the oysters and shrimps may be left out, and two, three, or four anchovies added instead.

Large eels are excellent prepared as follows: cut in pieces, the bones taken out, take grated bread crumbs, nutmeg in powder, pepper, salt, thyme, parsley, and lemon-peel shred fine, roll in egg beaten up, and then in the bread, &c.; have a deep pan with the lard, or what is better, clarified beef fat, *boiling*, as you should for all fish, which is to be thus cooked, and from the great heat, is done very rapidly, of a fine brown colour.*

Flounders should be killed by dividing the spine, just where the tail begins; they will bleed consider-

* The bone and pieces of flesh adhering may assist in making the stock for stewing eels.

ably, and if cooked in this manner, are very good and nutritious food. Gudgeons, small trout, roach, and dace, may also be cooked with, or without the bread crumbs, &c., provided the fat be boiling, being then 600 degrees of heat, which solidifies the albumen of the fish instantly; with the same intention although you can only get 212 degrees of heat in water, without salt, fish should always be put into it when boiling, as in the first recipe for boiling pike.

Barbel, which is considered by some not worth cooking, may be found very good food thus:—Scale and cleanse one or two large barbel, take a very sharp knife, cut the flesh off in collops, dip these in egg, then in bread crumbs, herbs, &c., as before directed, and cook same as eels; the remainder of the fish boiled, will feed fowls advantageously.

The packing fish in ice to bring it from distant parts is a great advantage; and you will be told by fishmongers that salmon is all the better for keeping:—do not believe a word of it—no one who ever tasted a fresh-caught salmon or trout, will be of that opinion. If, indeed, you could get it as soon as it arrived in the ice, it would be all very well for a *London* table, but would not be eaten by any one living on the bank of a salmon stream. Some of the second-rate fishmongers replace in ice, what they do not sell the first

day, it becomes, therefore, deteriorated in its sanative qualities. The fat of the salmon between the flakes is mixed with much albumen and gelatine, which very speedily decomposes, and no mode of cooking will prevent its injurious effects on a delicate human constitution. I am confirmed in this opinion by every scientific man with whom I have conversed, or who has ever written on the subject.

The quantity of fish of different species taken away and destroyed from Billingsgate in a year, as unfit for food, is enormous; it is to be regretted that the same supervision does not extend throughout the metropolitan district, and be extended to meat and vegetables; to the sale of which in an improper state for the nourishment of man, is to be attributed as much as to the want of cleanliness, and to foul air, the ravages of the periodical epidemic, the cholera!

Roach of not more than half a pound each, small trout, dace, smelts, gudgeons, and bleak, are excellent at the breakfast-table, when marionated according to the Italian method. Thus, scale and cleanse the fish, flour and cook in boiling oil till crisp, place them on sticks to drain; when cold, put them into STONE jars, they not being glazed with lead, which would be injurious; between each layer of fish put leaves of sage, a little rosemary, ginger, cloves, mace, and pepper in fine powder, and some salt, when the pot or jar

is filled if to eat presently, one part white wine and three parts vinegar, sufficient to cover the fish. If to keep, take vinegar, a little garlic, or eschalots, cloves, mace, whole pepper, rosemary, sage, and salt; let these boil quarter of an hour, pour it boiling on the fish; when cold, cover them close from the air with bladders; in removing any for use, let it be with an ivory or wooden fork or spoon; they will keep all the year.

Many other species of fish from the sea, or rivers, may be prepared in the same way. Or a more cheap mode to prepare any small fish, is to scale and cleanse, place them in a deep stone jar with spice, &c., and herbs as above; cover the fish with two-thirds vinegar and one-third water, tie stout *white* paper over the jar, and send them to the bakehouse.

Under the head "Crimping of Fish," are to be found in the observations of the late Sir Anthony Carlisle, as communicated by Mr. Accum, some very useful information. He says, "Both sea and river fish cannot be eaten too fresh. The gills should be of a fine red colour, the eyes glistening, the scales brilliant, and the whole fish should feel stiff and firm; if soft or flabby, the fish is old." I presume he means stale.

"To improve the quality of fish, they are sometimes subject to the process called crimping." Sir

Anthony says, "Whenever the rigid contractions of death have not taken place, this process may be practised with success. The sea-fish destined for crimping are usually struck on the head when caught, which, it is said, protracts the term of the contractibility, and the muscles which retain the property longest are those about the head. Many transverse sections of the muscles being made, and the fish being immersed in cold spring water, the contractions called crimping take place in about five minutes; but if the mass be large, it often requires thirty minutes to complete the process, by which means the flesh both acquires the desired firmness, and keeps longer."

Salmon caught by a net are not so fine in flavour as those caught by angling; and the latter are considered best for crimping. "Wild Sports of the West."

By this it appears to be supposed that the blow on the head renders the fish insensible to pain; and that the transverse divisions of the muscular fibre must take place to be of any utility, whilst they have the contractile power of remaining life.

Take a flounder, and kill it by the method I have before mentioned; it dies instantly, and you will see the whole muscular fibre of its body swell, and become firm. Cook one thus killed, and one left to die the lingering death occasioned by removal from the

water, and you would not believe them to be the same species of fish.

Look at our fishmongers' shops; crimped cod and salmon are frequently seen, whose muscular contractile power had been lost for twenty-four hours, or much longer before that *then useless* process was practised upon them.

Mr. Accum gave a very excellent recipe for pickling salmon; and those who have once tasted it, would never condescend to eat any of the common pickled salmon of the shops, consistently with health, delicacy of preparation, and flavour.

"Split the fish down the middle, divide each half into six pieces; make a brine of salt sufficient to cover the fish when placed in a fish kettle. Season with bruised pepper, mace, allspice, and simmer the whole till the fish is done, taking care not to boil the fish more than is barely sufficient. Then take out the pieces to cool, and put into a jar of stone ware. Strain off the spice from the liquor in which the fish has been boiled, and add to it a like quantity, by measure, of vinegar, and pour it over the fish; when cold,* tie it over with paper, and keep the fish submerged in the liquor by placing a weight on it."

* Suppose the quantity of the liquor in which the fish has been boiled be a quart, it will require the same quantity of good vinegar, and a pint of good port wine may be added with great

On trial, it is found that the brine to boil the fish in, should be about fifteen parts salt, and eighty-five parts of water; and when the fish is put into the jar, it should be ascertained how much liquid will cover the fish sufficiently, and then that the vinegar, &c., should not be less than the half of the whole quantity of liquid; also, that the spice should be tolerably large; some add a little powdered coriander seed.

Mackerel, by taking off their heads, and part of the skin of the belly, make an excellent dish prepared in the same way, but you must be careful not to over-boil them.

To cure Salmon dry.—Take three to four pounds of fresh salmon; divide it longitudinally, and take out the bone. Mix intimately together, one table-spoonful of salt, one dessert spoonful of moist sugar, and a piece of saltpetre, the size of a nutmeg, finely powdered; let a man or boy, with very clean hands and nails, rub this well over the fish; turn the fish, and rub it once a day during seven days; then wipe dry with a clean cloth, and hang it up, so as not to touch anything, in a warm place. When required

advantage. When the fish is all used, this liquor, with the addition of a little more vinegar, will be excellent to pour boiling over smelts or gudgeons in marianating them.

for use, broil a piece over a slow fire; rub fresh butter upon it, and serve.

Many other species of fish from fresh and salt water may be prepared, and dried in this way, apportioning the period of salting to the size, and thickness of the fish, always cutting off the heads; but the back-bone may be left in. If you have the convenience of a wood fire, they can be smoked. They should be hung up by a string, passed through part of the flap which covered the belly, so as, like the salmon, to have a current of air around them.

Dr. Mc Culloch, of Edinburgh, states that the antiseptic property of sugar will preserve salmon, whiting, and cod, fresh for several days; or if kept dry, there is no limit to their preservation. Open a salmon, say of seven or eight pounds, put in a large table-spoonful of brown sugar, let it remain in a horizontal position for three days, wipe, and hang it up, wiping and ventilating it occasionally; if flavour be desired, add to the sugar a teaspoonful of salt; if wished to be very firm, add the same quantity of saltpetre.

Water Souchy.—Place a dozen perch or flounders, or as many as are required, well scaled and cleaned, in a stewpan with two quarts, or a proportionate quantity of water, parsley roots, bruised, and leaves chopped coarsely, an eschalot or two, and a little lemon peel; boil till the whole flesh of the fish can

be pulped through a coarse sieve, with the liquor they were boiled in; place an equal quantity of cleansed fish in a stewpan, with finely chopped parsley, a very small quantity of powdered cloves, nutmeg, cinnamon, pepper and salt, a few small bearded oysters, minced, a few pickled mushrooms without the vinegar, quarter of a pint of white wine, and the pulp and gravy of the first quantity of fish; simmer very gently, till the fish are done, and serve.

Eels may be prepared the same way.

Having now given a few recipes for cooking fish of various kinds, it is proper to add directions for a sauce which, mixed with melted butter, will be found excellent as an adjunct to fried, or boiled fish, or to flavour the gravy of a hash, or stew.

Take claret or port wine, and mushroom catsup, of each one pint; walnut pickle half a pint, anchovies four ounces, fresh thin pared lemon peel, eschalots peeled, scraped horse-radish, of each one ounce, celery seed, one drachm; let these be all well pounded separately, and then intimately mixed, having first added allspice, and black pepper in fine powder, of each half an ounce, cayenne pepper and curry powder, of each two drachms; place altogether with the above liquids in a wide-mouthed, well-stopped bottle, for fourteen days, shaking it frequently; strain and press out the liquid, and add to the clear portion, quarter of a pint of real good soy: keep it well stopped.

Some persons add cinnamon to the spices previously mentioned, others dislike it.

This sauce will be found superior to that of the famed Hervey, who, more than fifty years ago, kept an inn at Bedfont, commanding a view of the churchyard, where, it is said, the Rev. James Hervey, who wrote "*Meditations on the Tombs,*" was buried.

Colman, in his "Random Readings," has the following:

"Hervey, whose Inn commands a view
Of Bedfont's church and churchyard too,
Where yew trees into peacocks shorn,
In vegetable torture mourn,—
Is liable no doubt to glooms,
From '*Meditations on the Tombs:*'
But while he meditates, he cooks;
Thus both to quick and dead he looks;
Turning his mind to nothing, save
Thoughts on man's gravy, and his grave.
Long may he keep from churchyard holes
Our bodies with his sauce for *soles!*
Long may he hinder Death from beckoning
His guests to settle their last reckoning."

Another, from an unknown hand, appeared more recently in a periodical.

"Two Herveys had a mutual wish
To shine in different stations;
The one invented sauce for fish,
The other Meditations!

Each had his pungent power applied
To save the dead and dying;
This relishes a *sole* that's fried,
That saves a *soul* from frying."

A curious opinion was entertained as to the nature of fish, by Phillip of Spain, the consort of our Queen Mary, who did not eat them, giving as his reason for not doing so, "that they were only element congealed, or a jelly of water."

In contrast to this, may be cited the conduct of Aterbates, Queen of Scythia, who interdicted her subjects from eating fish, "because there would not be enough to regale their sovereign."

In the "Northumberland Family Book," the breakfast for the earl and countess during four days of the week in Lent, was a loaf of bread in trenches, two manchets, *i. e.* two loaves of the finest flour, weighing six ounces each, a quart of beer, a quart of wine, two pieces of salt fish, six baconed herrings, four white herrings, or a dish of sproits (sprats). A tolerable commencement of a day of mortification in Lent.

THE NEGRO'S TRANSFORMATION OF FLESH INTO *FISH*.

A missionary of the Catholic Church induced a sly old negro, whom he found in India, to embrace his creed, and believing him to be a sincere convert, admit-

ted him to the sacrament of baptism, and gave him the name of James instead of Washee, which he had borne above forty years; this the negro thought was a most extraordinary proceeding. The priest insisted on James keeping the regular fast days, under the penalty of eternal misery; but the prohibition did not suit Washee's gastronomic propensity, and he adopted his own peculiar method of indulging his appetite, and yet avoiding the threatened punishment. The priest went into Washee's house on a Friday, and to his horror, found Washee regaling himself with a dish of beef steaks. The missionary in strong terms reprobated Washee's conduct; but the negro stoutly declared he was eating *fish* only, and thus endeavoured to prove it. "You took my hand, you put water on my face, and speakee fine words. I no understand, and den you say my name no more Washee, but now be James; well, dis morning, I takee de beef steak, and putting water over dem, make talkee, and say, 'No *more beef steak*, but *now* be FISH.'"

SUSPENDED ANIMATION.

It may be useful to give the rules published by the Royal Humane Society for restoring those apparently drowned, to which I have made some explanatory, and I hope useful additions. First send for a medical man immediately.

Cautions.—Lose no time; avoid all rough usage; never hold the body up by the feet; nor roll the body on a cask; nor rub the body with salt or spirits; nor inject tobacco smoke, or infusion of tobacco.

Convey the body carefully (and quickly) with the head and shoulders supported in a raised position, to the nearest house, where the following methods of treatment can be adopted. Strip the body as soon as possible, and rub it dry with hot cloths, then wrap it in hot blankets, and place it in a warm bed, in a warm chamber, free from smoke.

In order to restore the natural warmth of the body, move a moderately-heated, covered (with flannel) warming-pan over the back and spine.

Put bladders or bottles of hot water, or heated bricks, all covered with flannel, to the pit of the stomach, the arm pits, between the thighs, to the soles of the feet, and each side of the neck. Foment the body with hot flannels.

Rub the body briskly with the hand; do not, however, suspend the use of the other means at the same time; but if possible immerse the body in a warm bath at blood heat, 98° or 100° of the thermometer, as this is preferable to the other means for restoring warmth.

Volatile salts or hartshorn, or liquor ammonia, to be passed occasionally to and fro under the nostrils.

No more persons to be admitted into the room than are absolutely necessary, as they will consume the oxygen of the atmosphere.

Electricity was formerly found of great use in these cases when it could be applied; but, except at the Royal Humane Society's establishment, in Hyde Park, it was seldom available. Now the application of electro-magnetism is, or ought to be, in the power of every general practitioner, and no one ought to be without such an useful apparatus, which can be transported without the least delay or difficulty, to the spot where the body is lying, and by the adoption of the improvements which I have made in the apparatus, and modes of applying it, whereby it is rendered more effective, useful, and always ready for immediate service by following these directions.

First, have two pieces of German silver or copper wire, gauge No. 14, form them into this shape— These are to be placed in the orifices

of the standards of the two poles, and fixed by the screws in the standards. Next have two pieces of brass spring wire, a little less than a yard and a half each, and two lengths of stout narrow black ribbon, each a yard and a-half; let the edges be sewn together, pass the spring wire through them, press the ribbon tube back from the ends, draw three or four coils of the spring wire out, and anneal them in a spirit lamp, straighten these ends, then have ready four hooks made of the same size and kind of wire as the above, of this shape . Pass the annealed part of the spring wire two or three times through the ring of the hook, and return the end into the hollow of the spring wire, then draw down the ribbon close to the hook, pass two or three stitches of stout black silk through the loop, from one side of the ribbon case to the other, bind the end of the ribbon case with silk, and finish all neatly, so as to leave no end of wire or silk protruding. Obtain two tubes of glass, each six inches long, a full half an inch diameter, with a bore of a quarter of an inch; let these be ground and polished round at each end; then have two wires seven inches long, of German silver, guage No. 13, these to have a ring at one end, and a male screw at the other, whereon can be screwed a well-polished ball of German silver, half an inch diameter. The wires are to be passed through the glass tube,

the ball screwed on, and if the ball be placed on the flesh, and a person holding the tube move it about, the ball will roll wherever it is directed. Now to apply the electric current: hook one end of the covered spring wire to the ring of wire at one pole, and the other end to the ring of one wire in the glass tube, as the same with the other spring wire and contents of the other glass tube; it will be obvious that a person holding the glass tubes, one in each hand, he being thus insulated, will be able to pass the electric current in any direction, as whatever intervened between those two balls would receive it, and by the balls having a rotary motion, this agent can be applied more extensively and with less of pain. The part being moistened with a little compound soap liniment will render the application more powerful.

The liquid I use is in the proportion of one ounce of strong sulphuric acid to thirty ounces of distilled water, and the necessary quantity can be kept always ready for use in a *well-stoppered* bottle. The metals, as soon as used, should be washed in clean, tolerably warm water, the reason of which is, because they dry sooner, particularly if placed before the fire, and when dry they should be protected from the air.

In cases of suspended animation the current of electricity can be applied by this mode up and down the spine, and in every direction.

This apparatus is far superior to any I have ever seen, and can be adapted to most machines for applying electro-magnetism, or indeed for frictional electricity in some of its modifications.

There are machines of a powerful character which give an interrupted current, used at some of our hospitals to overcome the effect of narcotics.

All general practitioners should have a proper machine and apparatus for applying electro-magnetism, particularly those residing near rivers, lakes, or on the sea coast. The expense is trifling, and the utility very great.

I will with pleasure show any professional gentleman, or manufacturer of these machines my improvements.

APPENDIX.

No. 1.—(*See Frontispiece.*)

Callorhynchus Antartica.—Southern Chimæra. (Elephant Fish.)

This fish is a native of the Southern Ocean, where it generally inhabits the deepest recesses, and seldom approaches the shore, except during the breeding season. It is said to swim chiefly by night, and to prey upon the young of herrings, cod, and other smaller fishes; also on various sorts of mollusca and testacea.

Its general length is from two and a half to four feet.

Each jaw is furnished with a pair of broad, bony, laminæ, notched at the margin into a resemblance of numerous teeth, while in front, both above and below, stand two large semicircular, flattish, cutting teeth. The upper lip is extended into a lengthened cartilaginous flap, or appendage, bending downwards

in a reversed direction; hence its name of "Elephant fish."

An indented line runs across the forehead, and is continued in a serpentine course into the lateral line; this hollow is filled with numerous distinct pores.

The eyes are very large, and in the living fish, at night, shine with phosphorescent splendour.

The dorsal fin is very large, of triangular shape, furnished with a strong sharp spine, projecting beyond the finny part. This spine has a saw in front, like that part in a carp.

The pectoral fins are very large, and of a triangular shape; they are situate beneath the first dorsal. The ventral are of a similar shape, but much smaller, and placed at middle distance from the head to the middle of the tail, which is curved, the longest extremity on the upper side. At the base of each fin in the males, is a lengthened sub-cylindrical process, roughened by numerous sharp prominences in a reversed direction.

The female fish could not be thought to be of the same genera, were it not for the elongation of the upper lip.

Many naturalists, both English and foreign, have written on these fish. This account I partly condensed from "Shaw's Zoology," and partly from specimens in the British Museum, where a very ta-

lented young artist was allowed, at my solicitation, to make the drawing for me of this curious fish, lately added to that valuable collection.

No. II.—(See p. 110.)

The Blind Fish of the Mammoth Caves of Kentucky.

A gentleman, a patient of mine, informed me, a few days ago, that there were also blind fish in the waters of the Speedwell Mine, near the Peak, Derbyshire. I therefore wrote to the proprietor of the mine, and have been favoured with his reply, which is to the effect, that he has heard blind fish have been caught in those waters, and also the same report from the Guide of the Peake Cavern, through which the waters of the Speedwell Mine subsequently pass.

Should this gentleman obtain further information, in answer to enquiries he is so obliging as to promise he will make, and he learn anything authentic, he will communicate it to me.

At the British Museum, I have been favoured with an inspection of the blind fish, and cray fish, from the rivers of the caves of Kentucky.

No. III.—(See p. 252, and plate.)

The portable Gudgeon Rake.

The rake itself, A or B, being placed on the small

end of the pole, is to be fixed there by the screw (*c*) passed through the hole (*b*).

The pole I have, is put together by bayonet joints. A patent cord with a loop at the end is attached to the eye of the screw (*c*); the other end of the cord, properly stopped, is passed through the hole (*a*); the staples on each joint, and is made fast through the hole in the butt of the pole, so that no part can be lost.

I am of the opinion, that the parasol joint invented by Mr. Anderson, 71, Long Acre, for folding fly rods, made proportionably stouter, and to slide on brass ferules, is more simple, and the rake may be fixed to the pole by a stout spring pin, which is more convenient for carriage than having the pin attached to the rake.

The whole may be made lighter than mine, the dimensions of which I have here given.

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THIS BOOK MAY BE KEPT

FISHES AND FISHING

by W. Wright

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by W.Wright

FORESTA INSTITUTE FOR OCEAN MOUNTAIN STUDIES